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THE CHOICE OF ANESTHESIA FOR SERIOUSLY WOUNDED PATIENTS

HENRY K. BEECHER, M.D.
BOSTON

The relationship of anesthesia to shock is a particularly close one in military surgery, not only because of the frequency of the appearance of shock in warfare but also because anesthesia can be and often is the precipitating factor in the development of shock. Anesthesia can knock down the body's defenses and transform a compensated circulatory system into an inadequate one, with the result that profound shock appears in an individual previously not in shock. Several mechanisms which function in this way are fairly well understood and, although interesting, can scarcely be discussed here in detail, for my aim in this report is to set forth as clearly and as briefly as possible the considerations which determine acceptability or unsuitability of the common anesthetic agents for use in those who are seriously wounded. Emphasis is given to agents and technics which are suitable for use under circumstances of mobile warfare.

The material discussed here is limited to a consideration of the characteristics of real clinical importance as far as the several agents are concerned. The present report is not intended to be a review of the extensive literature on this subject. It is, on the contrary, a report based in large part on observations made in this clinic and laboratory. That the views expressed here reflect observations of others as well as our own goes without saying, since a considerable effort has been made to digest the many reports pertinent to the subject of anesthesia and shock.

Quite plainly definitive answers to all the questions that are asked on this subject cannot now be given, for information that is adequate to do so has not yet been obtained in many cases.

Unfortunately, many of the reports of the last war on this subject as well as reports coming out of this war have all too clearly been based on data obtained by men who were overwhelmed by routine duties, so that careful observations could not be made. As a consequence of this it is not surprising that the net effect is one of confusion filled with contradictions. Final answers can come only from trained observers in the field. A few men reasonably free from routine duties could really settle some of these problems. Until they are more certainly settled than is now the case, it it would be folly to neglect experience gained in dealing with severely wounded patients in civil life.

From the Anesthesia Service at the Massachusetts General Hospital and the Anesthesia Laboratory of the Harvard Medical School at the Massachusetts General Hospital.

Typical questions which urgently need complete answers from active military fronts are the following:

1. Is any agent better than ether for general surgery under field conditions? What are the limitations of ether? Where is it to be avoided if at all? By the use of a simple device [1] ether can be administered as simply as by "open drop" or "cone" methods and yet use only one-tenth the quantity of ether required by those methods. Does this have military value?

2. Does spinal anesthesia merit consideration for the seriously wounded, for the person in shock or in impending shock? (The majority of available reports are strongly against spinal anesthesia, yet it continues to be widely employed for the seriously wounded.) A carefully observed series based on objective data is an urgent need.

3. How much of the anesthesia load can the intravenous barbiturates carry in military surgery? What is their particular field of usefulness? What are their peculiar clinical limitations? Can they advantageously and safely supplement local anesthesia? Should the intravenous barbiturates supplant chloroform when a noninflammable general anesthetic must be used?

4. In the rare instances when cyclopropane will be available under military circumstances, does it have value adequate to justify great effort to make it available in base hospitals? How about its use for shocked individuals?

5. Can the anesthetic agents be used as therapeutic tools to delay or prevent shock?

At least partial answers to these questions emerge from the following consideration of the characteristics of the common anesthetic agents. No attempt is made to present here a well rounded pharmacologic or clinical discussion of these agents. The entire attention is focused on the qualities (of whatever nature) of these agents which suggest acceptance or rejection in the choice of the best agents for use under military circumstances.

ETHER

(*a*) *Desirable Qualities.*—The great potency of ether permits an adequate oxygen supply, even if only room air is available. Good muscular relaxation is provided. A great factor of safety is present under this agent: if gross overdosage occurs, respiration fails (intake stops) while the circulation remains unimpaired. The great factor of safety is of importance when anesthesia is administered by the unskilled, as often must be the case under military circumstances. (Ether excels all other safe inhalation agents with regard to the aforementioned points.) The excellent tolerance of even the impaired circulatory system for prolonged ether anesthesia is well established in man. While the foundation for this statement is good as far as "organic" impairment is concerned and on the basis of much more limited experience appears to be true also of the circu-

1. Beecher, Henry K.: An Easily Transportable Apparatus for Anesthesia With or Without Compressed Oxygen, War Med. **2**: 602-608 (July) 1942.

latory impairment encountered in shock, more data for man are urgently needed on this point. Man in shock appears to tolerate ether far better than animals in shock.

(*b*) *Undesirable Qualities.*—Under ether anesthesia there is some tendency toward acidemia. Considerable disturbance of carbohydrate metabolism occurs under this agent (the blood sugar level is elevated from 100 to 200 per cent). The agent is inflammable and explosive. Ether is "irritating" to the mucous membranes of the respiratory tract. No adequate demonstration has yet been made that this characteristic is of any importance in morbidity or mortality of postoperative pulmonary complications. On the contrary, there is much positive evidence that this so-called irritant quality is of no clinical importance.[2]

DIVINYL ETHER

While divinyl ether is easily transportable and swift in its action, it probably will have little value in military surgery because of the difficulty of using it satisfactorily without a closed rebreathing apparatus and also because of its tendency to cause laryngeal spasm, profuse salivation, muscular twitchings, even convulsions, and liver damage. These effects may be the result of breakdown products arising from its chemical instability. The agent has many of the other disadvantages of diethyl ether.

CHLOROFORM

(*a*) *Desirable Qualities.*—Chloroform can be administered smoothly with little equipment. It is easily transportable. It will neither burn nor explode. Because of its great potency, only a low concentration is needed in the inspired air; thus adequate oxygen can be obtained from the atmosphere. Good muscular relaxation is produced by it.

(*b*) *Undesirable Qualities.*—The effects of chloroform in producing death through ventricular fibrillation, central necrosis in the liver and destruction of the tubules of the kidney might be overlooked because of the urgency of other considerations in military surgery if it was not for the profoundly depressing effects of this agent on the circulation: the heart rate is slowed, the strength of contraction is weakened, the cardiac output falls, the blood pressure is depressed. Acidemia occurs.

It is true that the administration of high concentrations of oxygen in the inspired air will help to minimize the liver damage, as also will a diet high in protein and in carbohydrate. Unfortunately, these measures will not prevent the disastrous circulatory effects of this agent.

The only good reason for employing chloroform is its lack of inflammability, a matter of great importance on shipboard. It can be pointed out, however, that with the use of a new and exceedingly simple anesthesia apparatus[1] it is possible to administer "closed" ether with such economy that only a little need be at hand, with a resulting lessening of the ether fire hazard. This apparatus presents all the real advantages of the large cumbersome apparatus and yet in such a simple way that an orderly can administer the anesthesia under the direction of a surgeon. Particularly on shipboard, where a compact apparatus of this kind may easily be available, it would seem to be possible to eliminate chloroform in favor of ether. However, naval officers, to the present time at least, have decided that chloroform is indispensable.[3] (See also the discussion in this connection of the intravenous barbiturates, and of local anesthesia, to follow.)

ETHYL CHLORIDE

Ethyl chloride is easily transportable and adequate for brief general anesthesia. It is occasionally useful for induction of more slowly acting anesthetic agents, like ether, but in general ethyl chloride has the same drawbacks as chloroform and, in addition to them, is inflammable. Its usefulness in producing local anesthesia is fairly well limited to such trivial procedures as opening of boils; even so, the tissue damage produced by the freezing is considerable and does not justify its use when better methods are available.

NITROUS OXIDE, ETHYLENE, CYCLOPROPANE

Nitrous oxide, ethylene and cyclopropane all require the use and transport of steel cylinders and the use of cumbersome apparatus and require compressed oxygen for their successful employment; since neither cumbersome apparatus nor tank oxygen will be available in most cases, these agents will doubtless have little or no usefulness at military fronts, except perhaps in a few base hospitals.

In the case of nitrous oxide and ethylene, few metabolic effects are produced provided adequate oxygen is maintained. It is generally impossible to provide adequate oxygen if a surgical level of anesthesia is required in the case of nitrous oxide, even if compressed oxygen is available, for such a high partial pressure of nitrous oxide must be used that there is little room for oxygen. The same is true of ethylene although to a lesser extent. Only poor muscular relaxation is produced with either of these agents.

Nitrous oxide is not inflammable or explosive. On the other hand, both ethylene and cyclopropane are exceedingly explosive.

Cyclopropane[4] produces deleterious cardiac effects and death occurs apparently from ventricular fibrillation in a relatively high number of cases. Aside from that effect, however, the circulatory system of animals in shock or in approaching shock appears to tolerate cyclopropane better than any of the other inhalation anesthetic agents (Evans and Beecher[5]) with the possible exception of ethylene. Whether this is true of man in shock is unknown. Both cyclopropane and ethylene have the further good quality that induction and recovery can occur in a matter of a very few minutes. Accordingly, when it is necessary to explore the abdomen rapidly of a patient in shock or approaching shock, as for example when it is necessary to investigate with-

2. This is discussed by Beecher, Henry K.: Some Controversial Matters of Anesthesia for Thoracic Surgery, J. Thoracic Surg. **10**: 202-219 (Dec.) 1940. Beecher, Henry K., and Adams, Ralph: Ether Anesthesia in the Presence of Pulmonary Tuberculosis, J. A. M. A. **118**: 1204-1209 (April 4) 1942.

3. Without wishing to attempt to oppose their views, I should like to point out, however (with the simple anesthesia machine just mentioned), how little ether need be carried on board at a time. Comdr. Frederick R. Hook, M. C., U. S. Navy, in the Transactions of the American Surgical Association **59**: 135, 1941, says "We may assume that the maximum number wounded on capital ships will be 15 per cent of the ship's complement." On one vessel carrying 2,000 men, 300 wounded might be anticipated in a given major engagement. If one third of these (100) required full general anesthesia as with ether for a major operation, the total quantity of ether needed would only be about 100 ounces. Thus less than 10 pounds of ether would be adequate for a major encounter—no great problem as far as bulk or storage is concerned, and, as far as inflammability is concerned, even if the severely wounded casualties were 100 per cent larger than those estimated for a given encounter the total quantity of ether required on board would seem to me to be negligible in comparison with the other inflammable and explosive materials aboard. These remarks are offered only for consideration and are not in any way intended to be placed in opposition to current practices. Certainly many naval factors are concerned in this choice of which I am not aware.

4. Beecher, Henry K.: An Appraisal of Cyclopropane, editorial, Surg., Gynec. & Obst. **75**: 797-799, 1942.

5. Evans, Everett I., and Beecher, Henry K.: Unpublished data.

out delay the question of internal hemorrhage or perforated viscus, these two agents if available should, on the basis of present information, be ranked as first choice. In such a case any anesthesia is undesirable, but, if it must be used, the quicker its induction and the quicker the recovery from it, the better it will be for the patient.[6]

INTRAVENOUS BARBITURATES (EVIPAL, PENTOTHAL SODIUM)

The intravenous barbiturates have now been used widely enough to permit some comparison with other agents. When these agents are used for major as well as for minor surgery the death rate attributable to the agent varies from three to ten times higher (good to poor clinics) than it is for ether. In the Massachusetts General Hospital, where these agents are used almost entirely for short procedures (ten to twenty-five minutes) on able bodied young patients, the death rate appears to be low (8,000 cases with no deaths). So much for the ordinary cases. Early in this series we learned that bad risk patients tolerate these agents poorly unless very small quantities of the barbiturate are merely used as supplements to local or spinal anesthesia. Even then, in an adequate series of cases it was learned that the use of these agents to supplement spinal anesthesia was liable to produce a fall in blood pressure. Bad risk patients, particularly patients with circulatory impairment, tolerate full barbiturate anesthesia poorly. This statement can be made with emphasis on the basis of a large series of cases. Under circumstances in which it is imperative to have a noninflammable agent, it is possible that the intravenous barbiturates would make a better choice than chloroform. This point requires further clinical study.

We [7] have learned on the basis of laboratory studies of these specific agents that in addition to their cardiac depressant action there are two outstanding characteristics that make their use hazardous under conditions often encountered in patients:

First, there is a progressive loss, finally a complete loss, of sensitivity of the respiratory center to its normal chief stimulus, carbon dioxide. The blood content of carbon dioxide may rise to depressant levels under these agents. Second, with the normal respiratory drive either inadequate or lacking, the respiration is driven by anoxic stimulation of the peripheral chemoreceptors, carotid and aortic bodies chiefly. Anoxic stimulation of these bodies is as effective in deep anesthesia as in light.

These facts, simple as they are, point to strong reasons why these agents are tolerated poorly by patients in poor condition. The anesthetist relies almost entirely on the respiration to guide him as to depth of anesthesia. Under these barbiturates the respiration is a dependable guide only if the patient is breathing a high concentration of oxygen, for only then will the peripheral chemoreceptors remain inactive and the progressive depression of the respiratory center by the barbiturate be evident. In other words low blood oxygen, by stimulating respiration even during deep anesthesia, masks the true depth of anesthesia. Presumably, compressed oxygen will almost never be available in the field, so it would seem that the use of intravenous barbiturates should be limited in military surgery to brief, minor procedures or possibly used as a supplement to local anesthesia. This conclusion is reached not only because of the difficulty of determining and controlling depth of anesthesia in the field but also because of the demonstrated poor tolerance of the bad risk patient for full anesthesia produced by these agents. Possibly intravenous barbiturates should supplant chloroform for major surgery when a noninflammable general anesthetic is required.

SPINAL ANESTHESIA

Several facts have emerged from observations of the effects of spinal anesthesia which are pertinent to the anesthesia and shock problem. The most important of these are the following:

1. Blood pressure has a tendency to fall under spinal anesthesia. This tendency is so great and so serious that spinal anesthesia was practically discarded as a clinical tool until it was demonstrated that this effect could in most cases be prevented by the use of vasoconstrictor agents.

2. Vasoconstrictor agents are inadequate in a high percentage of cases to maintain safe levels of blood pressure during spinal anesthesia of patients who have been subjected to trauma or to hemorrhage.

3. In spinal anesthesia the vasomotor fibers are the first to be paralyzed and the last to recover. The extent over which this occurs is greater than the area where the pain response is eliminated, for a lower concentration of anesthetic can interrupt vasomotor control than can interrupt pain sensation. In interrupting vasomotor control, spinal anesthesia breaks down an important defense against shock.

Notwithstanding these facts, it is rather often argued that spinal anesthesia is still a desirable agent to use for the seriously wounded patient. Gordon-Taylor [8] spoke for the best of English military surgery when he said recently "Spinal anesthesia spells certain euthanasia for the shocked abdomen."

It is difficult to understand why there are in this country as many as there are who advocate the use of spinal anesthesia for surgery of the seriously wounded and otherwise poor risk patient. Even now, with data coming in from our own fields of action, spinal anesthesia is not showing up well. In such cases the proponents are liable to hold that in these specific cases the spinal anesthetic was not properly administered. The following data are pertinent to this question.

It has been possible to obtain an interesting comparison of good and bad spinal anesthesias and of the relationship of spinal to ether anesthesia, as far as blood pressure lowering effects are concerned, in the clinical data of the Massachusetts General Hospital (patients with perforated peptic ulcer). Part of these data were obtained under conditions in which the anesthesia was poorly administered and part in which it was well administered. It is interesting to compare the data from these two groups. It is strikingly demonstrated that under both good and bad circumstances the same ratio of blood pressure lowering (spinal anesthesia compared with ether) holds in the two cases, as shown in the table.

6. Speed of induction and speed of recovery are probably generally grossly overrated when a distinction is made between the three or four minutes required for cyclopropane and the ten minutes for ether. Occasionally, as in the aforementioned case, speed assumes real importance.

7. Others have reported these effects for other barbiturates. To the best of my knowledge the only two agents used to any extent for intravenous anesthesia had not been studied previously in this connection. Beecher, Henry K., and Moyer, Carl A.: Mechanisms of Respiratory Failure Under Barbiturate Anesthesia (Evipal, Pentothal), J. Clin. Investigation **20**: 549-566 (Sept.) 1941. Moyer, Carl A., and Beecher, Henry K.: Effects of Barbiturate Anesthesia (Evipal and Pentothal Sodium) on the Integration of Respiratory Control Mechanisms: A Study Directed Toward Improvement of Methods for the Preclinical Evaluation of Anesthetic Agents, J. Clin. Investigation **21**: 429-445 (July) 1942.

8. Gordon-Taylor, Gordon: The Changing Aspect of the Abdominal Surgery of Modern Warfare, Practitioner **147**: 448-462 (July) 1941.

Patients undergoing suture of perforated peptic ulcer constitute a group good for study in the present connection for the following reasons: These patients are in our experience liable to go into shock. The group is composed chiefly of men (97 per cent). They are on the average able bodied and not old (average age about 44 years). These patients are seen usually within one-half to four hours of their injury. The reparative operation is more standardized probably than any other major one to be encountered: the abdomen is opened, a small hole in the stomach or duodenum repaired and the abdomen closed; anesthesia and operation require in almost all cases one hour.

In the years preceding 1934, little attention was given to anesthesia at the Massachusetts General Hospital. The anesthesia of this period can accurately be labeled as poor. In the nine year period 1925-1933, inclusive, the records of 56 patients with perforated peptic ulcer contained enough data to permit inclusion here. In the nine year period 1934-1942 (September) inclusive 111 patients received ether or spinal anesthesia for repair of a perforated peptic ulcer. They are divided as shown in the table.

It is clear from these data that the number of serious falls of blood pressure is great under poor spinal anesthesia and by no means negligible under well conducted spinal anesthesia. Improvement of anesthesia (the surgical procedure has remained the same) cut to one-third the number of patients showing a serious fall in blood pressure both under spinal and under ether. The ratio of twice as many patients showing a fall of blood pressure to shock levels under spinal as under ether anesthesia is strikingly constant in both groups.

Results of Anesthesia of 167 Perforated Peptic Ulcer Patients at the Massachusetts General Hospital

Patients	Anesthesia		Per Cent	Patients Showing a Fall of Blood Pressure to 70 Mm. Hg or Below		Ratio of Serious Blood Pressure Falls
	Number			Number	Per Cent	Spinal : Ether
Group 1 Poor anesthesia 1925-1933	36	Spinal	64	11	30.5	2:1
	20	Ether	36	3	15.0	
Group 2 Good anesthesia 1934-1942	71	Spinal	64	8	11.2	2:1
	40	Ether	36	2	5.0	

Much further data could be marshaled to support the thesis that spinal anesthesia is a poor choice for surgery for the patient either in shock or in impending shock.

LOCAL ANESTHESIA

It is proper that local anesthesia should always be considered when it is important to have a noninflammable agent or when surgery is contemplated on the traumatized or exsanguinated patient and employed if the surgeon considers that it will be adequate for his task. The experience of the English in this war, however, has repeatedly shown that local anesthesia is poorly tolerated by the severely injured but conscious patient. Apparently the moderate discomfort occasionally associated with local anesthesia and the psychologic injury resulting from the knowledge that he is being operated on is adequate to produce enough bad reactions to cause many English surgeons to favor general anesthesia for treatment of the severely wounded person.

When local anesthesia is used, the following will minimize the not infrequently harmful circulatory effects of too great or too rapid absorption of the local anesthetic agent:

1. The addition of epinephrine hydrochloride (1:200,000 optimum final dilution) to local anesthetic solutions will prolong fivefold the effect of a given dose of procaine hydrochloride. This use of a vasoconstrictor agent will obviously greatly reduce the total quantity of procaine needed. [Vasoconstrictor agents should not be employed in local anesthetic agents under the following circumstances: (*a*) When the local anesthetic agent is injected around the genitalia, fingers, toes, ears or nose. If used here, sloughs may result. (*b*) When the local anesthetic agent is to be supplemented by cyclopropane, chloroform, ethyl chloride or avertin with amylene hydrate anesthesia. Ventricular fibrillation may result. Vasoconstrictor agents in local anesthesia should be employed only with great care if at all for patients with organic circulatory impairment.]

2. It must be remembered that the toxicity from absorption of local anesthetic agents increases in geometric proportion with increase in dose. While for an able bodied person it is usually safe to employ 150 cc. of 1 per cent procaine if administered over an hour's time, it does not follow that 75 cc. of 2 per cent can be used; rather, only about 35 cc. of 2 per cent can safely be used in this period.

The technical difficulties to be encountered in the employment of local anesthesia, while actually not great, will in the hands of those lacking special training in this field be associated with a considerable incidence of failure or only partial success and are time consuming. These facts will probably minimize the use of local anesthesia under military conditions.

SUMMARY AND CONCLUSIONS

1. The most difficult anesthesia problems that arise are those concerned with seriously wounded patients. Whenever possible, anesthesia and operation are avoided for patients in shock or in impending shock, until the patient's condition has improved as much as it will without surgery.

2. Whenever anesthesia must be administered to severely wounded patients, local anesthesia is employed, if considered adequate for the task at hand. This will rarely be the case for major procedures. Experience has shown that local anesthesia is in general best restricted to rather phlegmatic or apathetic patients, for whenever even minor surgical procedures must be carried out on apprehensive and suffering, badly wounded patients, surgical intervention under local anesthesia may be tolerated less well than under general anesthesia. An appraisal of the patient must be made as to his probable tolerance for the possible inconvenience and occasional discomfort of local anesthesia. Local anesthesia is always to be considered when a noninflammatory, nonexplosive agent is needed.

3. For major procedures inhalation anesthesia is generally preferable. Ether anesthesia is the best all around single anesthetic agent for use when major surgery must be carried out. When, in the surgeon's judgment, great speed of induction and speed of recovery are of outstanding importance, cyclopropane or ethylene is used, if available. This will probably rarely be the case.

4. Spinal anesthesia is poorly tolerated by severely wounded patients. Its use for such persons is often a major error.

5. Intravenous barbiturates (pentothal sodium, evipal soluble) are chiefly useful for producing general anesthesia for short procedures (twenty to thirty minutes) on robust young persons. They are often useful as supplementary agents when local anesthesia

proves to be inadequate. Intravenous barbiturate anesthesia appears to be preferable to chloroform for major surgical procedures when the use of a noninflammable, nonexplosive agent is imperative.

6. In studying the relationship of anesthesia to shock I have come to the following conclusions concerning clinical material:

(*a*) Even in large civil hospitals where many accident cases are received, the number of patients in shock or in seriously impending shock who must be operated on at once are far too few to permit any adequate civil study of the effect of the common anesthetic agents in shock. In the great majority of cases in civil life, when serious wounds are present, anesthesia and operation are properly deferred until the condition of the patient is so improved that he no longer constitutes a real test of the anesthetic agent in shock.

(*b*) Valuable and at present nonexistent data concerning the role of anesthesia in shock can be obtained with simple observations of the trend of the pulse and the blood pressure during operation under various anesthetic agents and their relationship to the appearance of shock. Accordingly, anesthesia is one of the few subjects in the field of shock which can profitably be investigated without hampering or delaying in any way the patient's treatment. Valuable anesthesia data can be obtained so simply that the confusion often attending the treatment of large numbers of seriously wounded men need not be increased by such studies. Probably few data of any real value can be obtained unless trained observers free from routine duties are on hand to get them. The conflicting reports from the active fronts have already demonstrated in this war as they did in the last one that catch-as-catch-can data obtained by busy clinicians whose primary duties lie in other fields are worse than useless: they are misleading.

(*c*) The shock problems fall sharply into two groups: (1) the complex, difficult, interesting problems which will only with great luck be solved in time to be of benefit in this war and (2) the simple, often dull, but urgent problems to which solutions are needed, and unlike those in 1, almost certainly can be solved. The requirement is an abundance of clinical material, far more than can be obtained in civil life (see first paragraph of summary). The best choice of anesthesia for various types of seriously wounded military patients has not yet been demonstrated. It can be determined only by trained observers under military conditions.

(*d*) In the entire consideration of shock, one of the few fields where we can be certain of effecting real improvements in current practices in time to be of benefit in this war is in the field of anesthesia and its relationship to shock. Little can be accomplished, even in this, unless far more clinical material is made available to trained observers than is now the case.

A Great Surgeon.—The mechanics of medicine and surgery can be acquired quickly by any reasonably intelligent person, but the morals of medicine and surgery can be acquired only slowly and require a painfully long period of training and preparation. If it can be said of any man that he is "an operating fool," the adjective "operating" is redundant. A great surgeon is not a man who has mastered the mechanics of a simple appendectomy or tonsillectomy or any other "ectomy," he is a man who knows not only how to operate but on whom an operation should be done and, more important, on whom an operation should not be done. Surgeons are great because they have sound judgment rather than mere mechanical skill.—Olson, J. G.: *Time*, Oct. 26, 1942, p. 6.

THE EFFECT OF EXTERNAL TEMPERATURE ON SHOCK

AN EXPERIMENTAL STUDY

K. G. WAKIM, M.D., PH.D.
AND
W. D. GATCH, M.D.
INDIANAPOLIS

Shock is a type of peripheral circulatory failure which causes a profound disturbance in the physiologic mechanisms of the body and leads to a syndrome exhibiting, among its manifestations, hemoconcentration, oligemia and a generalized peripheral vasoconstriction. In these unparalleled times, when injuries resulting in shock are not limited to our armed forces in combat zones all over the globe but may also occur *en masse* in our civilian population as a result of air raids or industrial accidents, a thorough investigation and careful appraisal of some of the methods employed in the treatment of shock are most timely. In the treatment of shock the application of heat is too much stressed. The public, as well as the physician, uses heat in abundance in the treatment of shock from whatever cause. In first aid instructions one is taught to apply hot water bottles, hot bricks or heated stones to the extremities and sides of an individual in shock.[1] That not only warmth but heat is recommended for the treatment of shock can be inferred from the warning expressed in books that great care must be taken to prevent the infliction of severe burns from the hot water bottles used on the person in shock.

In the light of our understanding of the physiologic principles involved in shock, this emphasis on the application of heat to shocked individuals made us interested in determining, experimentally, the influence of temperature on shock as well as the effect of heat on the survival time of shocked animals. From the evidence observed in our experiments, we learned that the application of heat or of cold greatly shortened the survival time of anesthetized animals in experimental shock, while the animals that were placed at room temperature and those placed on warm water bottles slightly above room temperature, after shock was produced, had a much longer survival time. An external temperature in the neighborhood of body temperature proved to be optimal. With the exception of a few of the animals that had to be killed after having survived beyond twenty-four hours, no attempt was made to apply any measure to prolong or to shorten the life of any of the animals used in this investigation.

In 1914 Mann[2] performed experiments involving exposure of abdominal viscera and demonstrated the significance of the loss of circulating fluid in shock. The effective circulating blood volume is decreased, and accompanying the decrease is a great reduction in volume flow. Blalock and Levy[3] demonstrated a sharp decrease in blood flow in hemorrhage and in intestinal trauma. Anoxia predominates whenever diminution of

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Mr. Bob Koons assisted in this work.

From the Indiana University School of Medicine, Bloomington and Indianapolis.

1. Owen, H. R.: The Treatment of Emergencies, Philadelphia, W. C. Saunders Company, 1919, p. 109. Currier, A. F.: How to Keep Well, New York, Century Company, 1924, p. 605. Boy Scouts of America: Handbook for Boys, Boy Scouts of America, 1940, p. 133.

2. Mann, F. C.: The Peripheral Origin of Surgical Shock, Bull. Johns Hopkins Hosp. **25**: 205-212, 1914.

3. Blalock, Alfred, and Levy, S. E.: The Effect of Hemorrhage, Intestinal Trauma and Histamine on the Partition of the Blood Stream, Am. J. Physiol. **118**: 734-738 (April) 1937.

blood flow becomes severe. Aub and Cunningham [4] observed in shocked cats and Freeman, Shaw and Snyder [5] noted in shocked patients a decided decrease in the oxygen content of venous blood. The loss of plasma due to dilatation of the capillaries and increase in their permeability was attributed by Krogh [6] and by Landis [7] to anoxia. Blalock [8] rightly emphasizes the fact that diminution in circulating blood volume is the initial and most important alteration in shock. Brooks and Duncan [9] observed that the temperature of a part is of great importance in determining the survival period of ischemic tissue. Allen,[10] in a study of surgical considerations of temperature in ligated extremities, noted that shock is more likely to accompany constriction of the circulation of the thigh if the local temperature is high than if it is low. Lahz [11] states that the optimum temperature for exsanguinated tissues is much lower than for normal tissues and that the former can be severely damaged by heating agents. Blalock and Mason [12] studied the effects of heat and of cold on large dogs in which shock had been produced either by removal of about one third of the blood volume or by trauma to

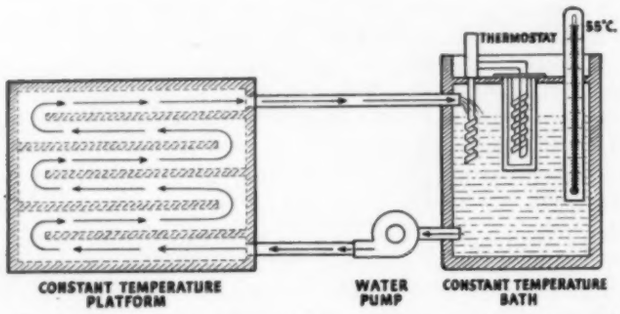

Fig. 1.—Diagrammatic representation of the constant temperature platform, pump and thermostat.

one of the posterior extremities. They concluded that significant elevations of temperature are more disastrous than depressions of similar degree.

METHODS

Dogs, rabbits, guinea pigs and rats were used in this study. Of each species, animals of practically the same weight (litter mates whenever possible) were selected and divided into six groups: a, b, c, d, e and f. Soluble pentobarbital was the only anesthetic used. The rat experiments in this communication were performed on black, hooded and albino litter mates unilaterally adrenalectomized four to five days previously. The rats and guinea pigs were anesthetized by subcutaneous administration of 5 mg. of soluble pentobarbital per hundred grams of body weight. The rabbits and dogs were anesthetized by intraperitoneal injection of 30 mg. of soluble pentobarbital per kilogram of weight. In rats, shock was produced by either of the two commonly known methods, namely by traumatization of the posterior extremities or by exposure of the abdominal viscera and intestinal stripping. Since it was observed that trauma to the extremities did not produce a satisfactorily uniform shock in rats, exposure of the abdominal viscera and intestinal stripping was the only method used in producing experimental shock in the dogs, rabbits and guinea pigs included in this communication. After the production of shock each animal of group a was placed on an ice bag at 5 C. (41 F); each animal of group b was placed on a bag at room temperature, 25 C. (77 F.); each animal of group c was placed on a warm water bottle at 35 C. (95 F); each animal of group d was placed on a warm water bottle at 45 C. (113 F.); each animal of group e was placed on a hot water bottle at 50 C. (122 F.), and each animal of group f was placed on a hot water bottle at 55 C. (131 F). The bags used were ordinary clinical rubber bags of the same size, shape and material and were wrapped in one layer of cloth while in use. After shock was produced the survival time of each animal of the six groups and the average survival time of each group were determined and tabulated. To determine the degree of hemoconcentration, the amount of hemoglobin was determined at intervals by means of the Sheard-Sanford photelometer [13] before and after shock was produced. All the large animals (rabbits and dogs) and some of the small ones were placed on a specially constructed constant temperature platform connected by means of an Eastern centrifugal pump (fig. 1) to a thermostat set at the required temperature. The blood pressure of the large animals was recorded on a revolving kymograph by means of a mercury manometer connected to a glass cannula in the common carotid artery. A 3.5 per cent solution of sodium citrate was used to prevent coagulation in the arterial cannula.

RESULTS

Rats.—The rats placed on hot water bottles at a temperature of 55 C. after the production of shock, whether by intestinal stripping or by trauma to the extremities, died within a period of two hours. Their average survival time was 1.26 hours. The temperature of the water dropped from about 55 C. to about 45 C. in the first hour and to about 38 C. by the end of the second hour. Most of the rats that were placed on an ice bag after shock was produced lived a little longer than those placed on the hot water bottle at 55 C. Their average survival time was 2.54 hours. The rats that were placed on a hot water bottle at 45 C. after shock was produced had an average survival time of 3.36 hours. All the rats that were kept at room temperature or were placed on a warm water platform the temperature of which was maintained at 35 C. survived much longer than either the group that was heated or the group that was chilled. The minimal survival time of the group that was kept at room temperature (25 C.) was 14.83 hours. Several animals were killed after they had survived more than twenty-four hours. The average survival time of the rats that were exposed

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to room temperature was at least 23.2 hours. The average survival time of the group that was placed on the warm water platform the temperature of which was maintained at 35 C. was 35.52 hours. Table 1 gives detailed data on the individual rats used in each group.

TABLE 1.—*The Effect of External Temperature on Experimental Shock (Rats)*

Rat	Environmental Temperature	Survival Time	Average Survival Time	Type of Shock
1a	Ice bag 5 C.	1.16 hours	Group a 2.54 hours	Intestinal stripping
2a		6.50 hours		Intestinal stripping
3a		1.08 hours		Intestinal stripping
4a		2.33 hours		Intestinal stripping
5a		1.25 hours		Intestinal stripping
6a		2.00 hours		Trauma to extremities
7a		3.50 hours		Trauma to extremities
1b	Room temperature 25 C.	25.50 hours	Group b 23.20 hours	Intestinal stripping
2b		16.50 hours		Intestinal stripping
3b		24.00 hours		Intestinal stripping
4b		14.83 hours		Intestinal stripping
5b		24.00 hours		Intestinal stripping
6b		29.75 hours		Trauma to extremities
7b		28.08 hours		Trauma to extremities
1c	Warm water bottle 25 C.	17.66 hours	Group c 35.52 hours	Intestinal stripping
2c		48.16 hours		Intestinal stripping
3c		39.25 hours		Intestinal stripping
4c		30.00 hours		Intestinal stripping
5c		16.91 hours		Intestinal stripping
6c		49.16 hours		Trauma to extremities
7c		47.50 hours		Trauma to extremities
1d	Warm water bottle 45 C.	1.50 hours	Group d 3.36 hours	Intestinal stripping
2d		1.58 hours		Intestinal stripping
3d		10.25 hours		Intestinal stripping
4d		1.41 hours		Intestinal stripping
5d		2.41 hours		Intestinal stripping
6d		4.00 hours		Intestinal stripping
7d		2.41 hours		Intestinal stripping
1e	Hot water bottle 50 C.	1.25 hours	Group e 2.50 hours	Intestinal stripping
2e		2.41 hours		Intestinal stripping
3e		1.83 hours		Intestinal stripping
4e		3.25 hours		Intestinal stripping
5e		2.50 hours		Intestinal stripping
6e		2.66 hours		Intestinal stripping
7e		3.66 hours		Intestinal stripping
1f	Hot water bottle 55 C.	1.08 hours	Group f 1.26 hours	Intestinal stripping
2f		1.00 hour		Intestinal stripping
3f		1.08 hours		Intestinal stripping
4f		1.83 hours		Intestinal stripping
5f		1.25 hours		Intestinal stripping
6f		1.50 hours		Trauma to extremities
7f		1.08 hours		Trauma to extremities

The average hemoglobin value for the rats before the production of shock was 15.5 Gm. per hundred cubic centimeters. The average hemoglobin value for the rats in shock from intestinal stripping was 21.2 Gm. per hundred cubic centimeters; that of the animals in shock from trauma to the extremities averaged 16.9 Gm. per hundred cubic centimeters. This difference in hemoconcentration of the rats in shock produced by intestinal stripping as compared with those in shock by trauma to the extremities is attributable to the loss of blood due to hemorrhage into the traumatized extremities.

Guinea Pigs.—The guinea pigs that were shocked and placed on ice bags at 5 C. had an average survival time of 0.93 hour; those placed at room temperature had an average survival time of 17.28 hours; those placed on warm water at 35 C. had an average survival time of 18.14 hours; those placed on warm water at 45 C. had an average survival time of 5.53 hours; those placed on hot water at 50 C. had an average survival time of 3.18 hours, and those placed on hot water at 55 C. had an average survival time of 1.7 hours. Table 2 gives detailed data on the individual guinea pigs used in each group.

Before shock, the guinea pigs had an average hemoglobin content of 16 Gm. per hundred cubic centimeters of blood. Prior to death from experimental shock the value for hemoglobin rose to an average of 20.2 Gm. per hundred cubic centimeters.

Rabbits.—The rabbits that were placed on ice bags at 5 C. after shock was experimentally produced had an average survival time of 3.41 hours. Rabbits placed at room temperature after the production of shock had an average survival time of 7.62 hours; those which were shocked and placed on warm water at 35 C. had an average survival time of 8.87 hours; those placed on water at 45 C. after shock had an average survival time of 4.66 hours; those placed on water at 50 C. after shock had an average survival time of 0.78 hour. One rabbit was shocked and kept on water at 55 C.; it survived only 0.41 hour.

Before shock was produced the rabbits had an average hemoglobin content of 12.1 Gm. per hundred cubic centimeters of blood. Prior to death in experimental shock the value for hemoglobin rose to an average of 16.6 Gm. per hundred cubic centimeters.

The mean arterial pressure measured by a mercury manometer connected to the common carotid artery of the rabbits averaged 115 mm. of mercury before shock and 65 mm. of mercury immediately after the production of shock. Throughout the experiment the blood pressure gradually declined until it reached 0 at the time of death of the animal (fig. 2).

Dogs.—The 2 dogs that were placed on an ice bag at 5 C. after shock had been produced had an average survival time of 2.29 hours; 2 dogs that were placed at room temperature (25 C.) had an average survival time of 14.25 hours; the 2 that were placed on warm water at 35 C. had an average survival time of 16.58 hours; 2 dogs that were placed on warm water at 45 C. had an average survival time of 10.91 hours; the 2 dogs that were placed on hot water at 50 C. had an average survival time of 3.87 hours, and the 2 that were placed on hot water at 55 C. had an average survival time of 3.5 hours.

Before shock the dogs had an average hemoglobin content of 13.1 Gm. per hundred cubic centimeters of blood. Prior to death in experimental shock the value for hemoglobin rose to an average of 20.1 Gm. per hundred cubic centimeters.

TABLE 2.—*The Effect of External Temperature on Experimental Shock (Guinea Pigs)*

Guinea Pig	Environmental Temperature	Survival Time	Average Survival Time	Type of Shock
1a	Ice bag 5 C.	0.41 hours	Group a 0.93 hours	Intestinal stripping
2a		0.75 hour		Intestinal stripping
3a		1.25 hours		Intestinal stripping
4a		1.33 hours		Intestinal stripping
1b	Room temperature 25 C.	10.58 hours	Group b 17.28 hours	Intestinal stripping
2b		19.66 hours		Intestinal stripping
3b		28.16 hours		Intestinal stripping
4b		10.75 hours		Intestinal stripping
1c	Warm water bottle 35 C.	14.50 hours	Group c 18.14 hours	Intestinal stripping
2c		19.83 hours		Intestinal stripping
3c		23.16 hours		Intestinal stripping
4c		15.08 hours		Intestinal stripping
1d	Warm water bottle 45 C.	6.16 hours	Group d 5.53 hours	Intestinal stripping
2d		6.75 hours		Intestinal stripping
3d		5.16 hours		Intestinal stripping
4d		4.08 hours		Intestinal stripping
1e	Hot water bottle 50 C.	3.50 hours	Group e 3.18 hours	Intestinal stripping
2e		2.25 hours		Intestinal stripping
3e		1.91 hours		Intestinal stripping
4e		5.08 hours		Intestinal stripping
1f	Hot water bottle 55 C.	0.41 hours	Group f 1.70 hours	Intestinal stripping
2f		1.50 hours		Intestinal stripping
3f		2.08 hours		Intestinal stripping
4f		2.83 hours		Intestinal stripping

The mean arterial pressure measured by a mercury manometer connected to the common carotid artery of the dogs averaged 150 mm. of mercury before shock and 105 mm. of mercury immediately after the production of shock. Throughout the experiment the blood pressure gradually declined until it reached 0 at the time of death of the animal.

The experiments on rats, guinea pigs, rabbits and dogs in shock yielded similar curves of survival time plotted against the various external temperatures employed in this study. Temperatures below that of ordinary room temperature and those above 45 C. have deleterious effects on shocked animals. Figure 3 gives a composite picture of the influence on the survival time of the various external temperatures in contact with the body of animals in experimental shock.

In order to determine the effects of the various temperatures on normal anesthetized animals as compared with their litter mates under identical conditions, but in experimental shock, controls of the various species used were anesthetized and placed at the various temperatures that were used for the shocked animals. The controls for each group were kept at the specified temperature for a period equivalent to the average survival time of the shocked animals of that group. All the control animals anesthetized and placed at room temperature, at 35 C. and at 45 C. recovered from anesthesia and remained normal thereafter. Of the controls placed at 50 C., the dogs, rabbits and guinea pigs survived and remained normal thereafter, but 50 per cent of the rats died and the other 50 per cent survived and remained normal thereafter. Of the control animals placed on ice bags at 5 C., only the rats died, while the guinea pigs, rabbits and dogs survived and were normal thereafter. These control data indicate that both extremes of temperature, the ice bag at 5 C. and the hot water above 50 C., have deleterious effects even on normal animals.

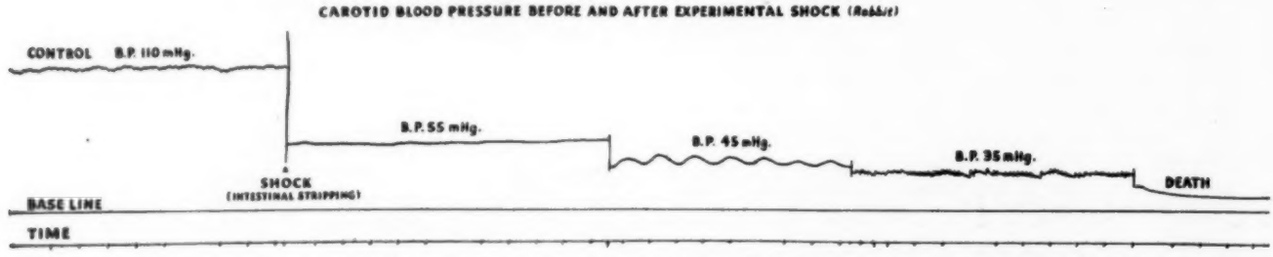

Fig. 2.—Chronologic changes in arterial blood pressure during experimental shock. The temperature in contact with the animal's body was 50 C.

COMMENT ON THE PHYSIOLOGIC MECHANISMS INVOLVED

Among the physiologic mechanisms which nature calls into play to compensate for the decrease in blood volume during shock is an immediate generalized peripheral vasoconstriction which brings about a reduction in the capacity of the vascular tree. This reflex vasoconstriction manifests itself in the blanching of the skin and contributes to the sensation of cold experienced by the individual in shock. The blanching of the skin and the cold sensation associated with it caused many to be overzealous in applying excess heat in cases of shock. This is done without realizing that heat would merely work against the efforts of nature by bringing about, among other things, a peripheral vasodilatation and thus defeat the purpose of saving the shocked individual. The reflex peripheral vasoconstriction is nature's protective mechanism to provide a decrease in vascular capacity as an adaptation to the decrease in blood volume, while the application of heat prevents the action of this reflex.

We have employed various gradations of external temperature in order to determine the ranges of temperature which are deleterious and those which are favorable aids in maintenance and survival of animals in shock. We found that external temperatures in the neighborhood of body temperature are favorable while anything below room temperature or much above body temperature is not only unfavorable but deleterious and hastens the fatal outcome. In fact Mann [2] was able to produce shock in animals by the use of excessive heat (60 C.) or cold (ice water). Excessive heat will do harm to the shocked organism in several ways:

1. It will produce a widespread superficial vasodilatation and distribution of blood to nonessential parts and thus counteract the protective natural reflexes that brought about peripheral vasoconstriction in the skin and neighboring tissues which are not so vitally in need of blood during the emergency of shock. This protective superficial vasoconstrictor reflex was brought about to serve the purpose of narrowing the capacity of the vascular tree to cope with the diminished blood volume (oligemia and hemoconcentration) in shock. Bazett [14] states that simultaneous heating of the whole surface of the body would increase the blood content of the skin by about half a liter. Prinzmetal and Wilson [15] reported an increase in the blood flow in the arm from 1.7 cc. per hundred cubic centimeters a minute in a bath at 24 C. (75.2 F.) to a flow of 14.9 cc. in a bath at 45 C. (113 F.). This is due mostly to an increase in the cutaneous circulation. On immersion of the foot and leg in water at a temperature of 40 to 47 C. (104 to 116.6 F.) Benson [16] obtained an average increase of 2.76 per cent in the volume of the limb. In shock, in which the blood volume is significantly reduced and concentrated, heating the skin brings the blood to the heated body surface and thus reduces the blood flow to vital structures such as the central nervous system and myocardium. It thus becomes evident that heating the shocked patient defeats the purpose of trying to save him because a large part of his blood will go to the skin. However, we do not imply here that the patient should be left shivering on the roadside to die from cold; we mean he should not be overheated. We firmly believe in wrapping the patient up in blankets and

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keeping him comfortable and warm but not hot. The evidence presented in this report indicates that it is better to err on less heat than on more heat in such circumstances.

2. Excessive heat will increase the metabolism and the oxygen requirement of tissues. Metabolic activities of tissues are chemical reactions, and it is a well known fact that, within certain limits, the greater the increase in temperature the faster the rate of the chemical reaction. In the presence of an already existing anoxemia in shock, overheating the patient necessitates the utilization of more oxygen and hence leads to a more severe anoxemia, which will increase capillary damage and capillary permeability and may terminate fatally. Landis [17] has definitely shown that vasodilatation increases capillary pressure and consequently the latter results in increased transudation through the capillary wall. The loss of fluid from the vascular system and its accumulation in the tissues will increase the edema. The rate of this transudation and edema formation will be hastened in the presence of a high temperature, and consequently the oligemia and hemoconcentration become worse. The subnormal temperature recognized as a part of the shock syndrome may act as a protective mechanism because it decreases the rate of metabolic activity of the tissues and consequently reduces the demand of the body for oxygen which is not sufficiently available. Blalock and Duncan [18] express the opinion that the favorable effects of the application of ice to injured extremities is due to a lowering of the metabolism of the part during the period of anoxia.

3. Excessive heat is likely to increase perspiration and consequently promote dehydration. The promotion of dehydration, in the presence of hemoconcentration and oligemia already existing in a state of shock, will create a vicious cycle the outcome of which will be a greater hemoconcentration, which is bound to lead to untoward effects.

4. The burns often produced when hot water bottles are applied to semicomatose patients are so familiar to the clinician that they need only be mentioned here.

The following are the physiologic mechanisms involved in the production of superficial vasodilatation as a result of application of heat to the skin:

1. The direct local dilator effect of heat on the blood vessels in the skin and neighboring tissue: This dilator reaction starts immediately and lasts as long as the heat stimulus remains in contact with the skin. Freeman [19] demonstrated the direct dilator effects of heat on blood vessels in normal and in sympathectomized hands. Trotter and Davies [20] showed such direct vasodilator effects of heat on the blood vessels in completely denervated areas of skin. Lewis [21] believes that heat increases the concentration of vasodilator substances in tissues and that this leads to vasodilatation in the heated areas.

2. Central hypothalamic inhibition of vasomotor tone induced by the rise of temperature of the circulating blood: This takes place after the blood gets heated enough to stimulate the heat regulating center and persists until either the center fails or the heat is taken off and the temperature of the blood returns to normal. The central action is manifested by the delayed induction of vasodilatation in the vessels of the arm when the feet are placed in hot water for some time. This appears after the body temperature becomes elevated.[22] The impulses for such central action are transmitted through nerve tracts and are abolished from completely sympathectomized extremities.

3. Reflex inhibition of vasomotor tone: This includes the well known axon reflexes of the vessels of the skin and other types of reflexes.

All these points support the fact that the wisest thing to do with persons in shock is to avoid exposing them to cold by wrapping them in blankets, but too much heat is contraindicated and the wholesale use of hot water bottles around the body of the patient in shock should be condemned. The room of the shocked patient should be kept around 85 F., which is sufficient to give him a comfortably warm environment. We firmly believe in wrapping up a shock person with blankets and in keeping him comfortably warm, but we strongly advise against chilling or overheating him. As long as whatever is lost, whether it is plasma or whole blood, is not replaced, overheating will counteract rather than work favorably with nature's protective reflexes.

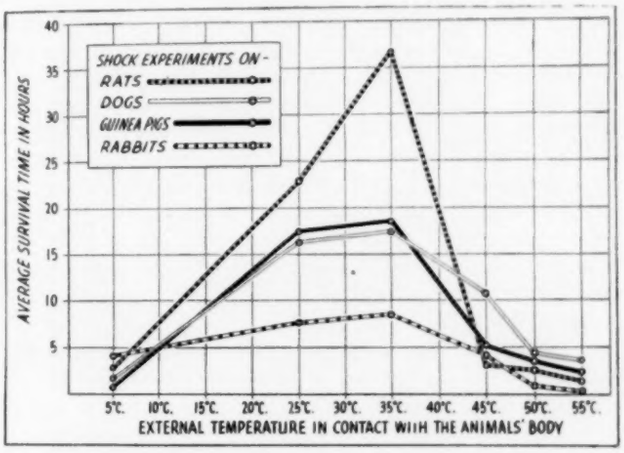

Fig. 3.—The average survival times of different species of experimentally shocked animals which were placed at various external temperatures.

SUMMARY

The effects of various external temperatures in contact with control and experimentally shocked animals were investigated. Cold and heat proved to be deleterious to the life of animals in shock. An external temperature in the neighborhood of that of the mammalian body seems to be optimal for the survival of shocked animals. These findings justify the conclusion that as long as whatever is lost, whether it is plasma or whole blood, is not replaced, heating or chilling shocked animals is harmful, while keeping them comfortably warm contributes favorably toward their survival.

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USE OF ULTRAVIOLET RADIATION IN REDUCTION OF RESPIRATORY CROSS INFECTIONS

IN A CHILDREN'S HOSPITAL: FINAL REPORT

ELIZABETH CHANT ROBERTSON, M.D.
M. ELIZABETH DOYLE, M.A.
AND
FREDERICK F. TISDALL, M.D.
TORONTO

Following the installation in this hospital of a new operating room equipped with a battery of eight Westinghouse Sterilamps and an air changing system, counts were made of the bacteria in the air of this room. Either of these agents reduced the number of air borne bacteria, and the combination of the two was very effective.[1] This suggested the possibility of using similar means to reduce the number of cross infections in the infant ward.

In order to test the efficacy of various barriers to the spread of air borne bacteria, an experimental room was set up in the laboratory.[2] It consisted of a series of open door cubicles the entrances of which were 4 feet wide and 6 feet 2 inches high. Around the cubicle entrances, General Electric Ultraviolet Germicidal lamps (15 watt, T8) were mounted with baffles in front and behind them so that a narrow curtain of ultraviolet radiation was thrown across the entrances. The number and arrangement of the lamps and the extent of the partitions at the sides of the cubicles were varied until a satisfactory combination was found. Their effectiveness was determined by spraying diluted cultures of Bacillus prodigiosus into the air and taking air samples with a Wells air centrifuge[3] in various parts of the room. An air changing system was also installed and the best positions for the supply and exhaust vents were similarly determined.

Very few organisms passed from one cubicle to another with the following arrangements:

1. Six ultraviolet lamps mounted around the cubicle entrances.
2. Partitions above the entrances extending to the ceiling.
3. Side partitions from floor to ceiling.
4. An air inlet near the floor at the back and an exhaust on the ceiling near the front of each cubicle.

Shorter partitions and fewer lamps were less effective.[4]

RESULTS WITH ULTRAVIOLET RADIATION BARRIERS IN THE INFANT WARD

A room in the infant ward was then remodeled embodying the information obtained in this preliminary study. It provided accommodation for 6 infants under 6 months of age. The floor plan is shown in figure 1. Six ultraviolet lamps were mounted around the outer door which led into the vestibule used by the nurses, 6 more around the inner door which led into the room proper and 6 more around each of the cubicle entrances where there were no doors. The details of the positions of the lamps and reflectors are shown in figure 2. The room was heavily insulated but since there was no cooling apparatus in the system there were great variations in the temperature and humidity. A small basin with foot controlled taps was installed near the front of each cubicle. A cubicle is shown in figure 3.

Before this ward was put into use, experiments were carried out to check the efficiency of the radiation barrier. The Wells test for sanitary ventilation was used, with B. prodigiosus as the test organism, as described in a previous paper.[2] The efficiency of the lamps was found satisfactory when no air changing was used or when the air was changed four, six or nine times an hour. Nine air changes an hour were therefore used.

When the apertures of the boxes in which the ultraviolet lamps were mounted were 3 inches wide, the bactericidal effect was excellent, but the nurses suffered from burning of the skin. The apertures were therefore reduced to 1½ inches. They were still effective but no longer caused burning provided the inside walls of the boxes were painted a dull black. The reflectors behind the lamps were made of aluminum.

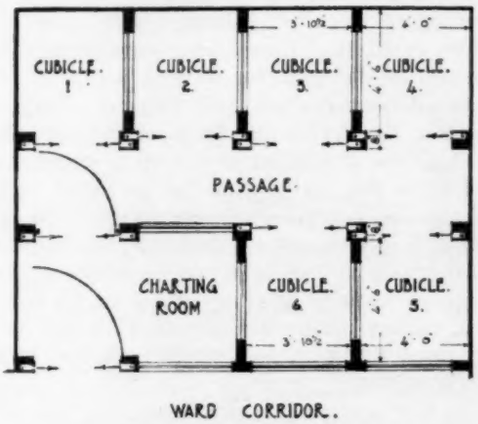

Fig. 1.—Plan of room equipped with ultraviolet lamps. Arrows show direction of ultraviolet rays.

Dr. L. R. Koller of the Research Laboratory, General Electric Company, Schenectady, N. Y., determined the amount of ultraviolet radiation in various parts of the room. At the back of the cubicle where the baby's cot was placed there was so little that it could not be measured. All members of the staff wore untinted glasses when working in this room. No other precautions were necessary for their protection. The nurses were instructed not to hold any infant near the doorway of the cubicle, and no case of burning or conjunctivitis occurred.

Four ultraviolet lamps, two on each side, were mounted in the air duct, which was 14 inches by 14 inches in cross section. This duct carried outside air into the room. The air passed the lamps at a rate of 218 linear feet a minute. To test the bactericidal power of these lamps, diluted broth cultures of B. prodigiosus were sprayed directly into the duct 2 feet ahead of the first lamps. Samples of duct air before and after passing the lamps were then taken simultaneously with two Wells centrifuges. The results obtained in one test are shown in table 1.

Similar results were obtained in five other tests, and it was concluded that the air entering the room through

From the Department of Pediatrics, University of Toronto Faculty of Medicine, and the Hospital for Sick Children, under the direction of Alan Brown, M.D., F.R.C.P.(Lond.).

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2. Robertson, Elizabeth C.; Doyle, M. Elizabeth; Tisdall, F. F.; Koller, L. R., and Ward, F. S.: Air Contamination and Air Sterilization, Am. J. Dis. Child. **58**: 1023 (Nov.) 1939.
3. Wells, W. F., and Wells, Mildred: Measurement of Sanitary Ventilation, Am. J. Pub. Health **28**: 343 (March) 1938.
4. Much of the apparatus used in this work was either lent or donated by the Canadian General Electric Company or the General Electric Company, and members of the research and engineering staffs of these companies assisted the authors on numerous occasions.

the air conditioning system was practically sterile. Previous Wells samples of outdoor air, taken at the level of the air intake, showed 2 to 3 organisms per cubic foot. No recirculated air was used in this room, but the ultraviolet lamps were mounted in the ducts in case there were some leaks in the system.

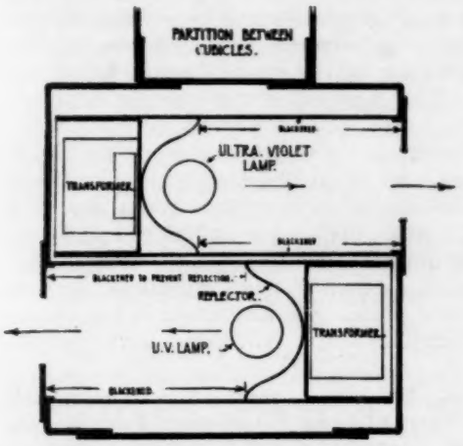

Fig. 2.—Mounting of ultraviolet lamps in posts between cubicles.

To show whether this type of room was effective in practice, we compared the incidence of respiratory cross infections among infants treated in it with that among similar infants in one of our usual unpartitioned rooms of the same size where the 6 cots were spaced around the walls. This room was ventilated by two windows and a transom over the door. This was called the first open control. The same physicians, nurses and maids worked in the two rooms. The nurses did not work elsewhere. After the babies in these two rooms were under observation for about five months, a second of the usual open rooms which accommodated 6 infants was used as another control. This was known as the second open control room. The babies in this room were nursed under the usual ward conditions, which meant frequent changes of nurses.

The admissions were divided between the three rooms, and most of the babies were "clean," that is free from respiratory or other infections, when admitted. If a baby

TABLE 1.—*Bactericidal Effect of Lamps in Air Duct*

	Number of Colonies per Cubic Foot of Air		
	Before Passing Duct Lamps	After Passing Duct Lamps	Percentage Killed
1st samples	14,330	12,460	Lamps off
2d samples *	13,060	351	Lamps on
3d samples	14,700	397	97
4th samples	13,580	368	97
5th samples	12,500	426	97

* The ultraviolet lamps were turned on immediately after the first samples were taken.

came in suffering from a respiratory disease which apparently cleared up, we did not consider the appearance of pyrexia, running ears, running nose, bronchitis or pneumonia within two weeks of the apparent recovery as due to a fresh infection. If the baby was clear of infection for two weeks and then developed an infection (for diagnosis see the criteria mentioned later), this was counted as a fresh infection. Most of the babies were in the rooms for more than two weeks.

For babies who were admitted without signs of infection or were free of these for the preceding two weeks, we used as our criterion for a hospital infection the following points:

1. If the baby developed an infection within the first three days in the hospital it was said to have been acquired before admission. Infections appearing in a "clean" baby after the third day were taken as hospital infections. This is an arbitrary rule, but it appears likely that the incubation period for the common cold is not more than three days.

2. If a baby showed any of the following signs—definite nasal discharge; a swollen, red throat; postnasal drip; discharge from the ears, or signs of bronchial or pulmonary disease—a diagnosis of a respiratory infection was made, even when there was a normal tempera-

Fig. 3.—Cubicle in ultraviolet equipped room.

ture. The prompt administration of sulfathiazole when symptoms of respiratory infection appeared may have been responsible for keeping the temperature at normal levels.

3. A temperature of 101 F. or higher for one day or 100 F. for two days in succession was taken as indicating a respiratory infection unless some other cause for this fever was discovered.

The following precautions were in force throughout the whole ward: All members of the staff wore masks made of one layer of fine flannelet, and they washed and applied a hand disinfectant (Dettol) which had been tested and found effective before attending a baby. Visitors were not allowed in the rooms and the floors were invariably cleaned by washing (no sweeping).

SERIES 1.—*Comparison of Infections Occurring in Ultraviolet Equipped Room and Open Control Rooms.*—The clinical results of the first nine months are shown in table 2.

These infections were also classified as to their severity. A child who had a temperature of 100 F. for two successive days or of 101 F. for one day, but no signs of respiratory infection, was classified as having pyrexia, provided a thorough physical and laboratory examination failed to reveal any other cause for the fever. If he had signs of nasopharyngitis but no fever, the infection was called mild. Babies who developed bronchitis, pneumonia, running ears or prolonged high fevers associated with symptoms of nasopharyngitis were classified as having severe infections. Less severe infections were called moderate. The severity of the infections occurring in the first nine months is shown in table 3.

TABLE 2.—*Number of Infections in Ultraviolet Equipped and Open Control Rooms*

Type of Room	Date	Number of Babies	Number of Babies Developing Infections	Percentage of Babies Developing Infections
Ultraviolet equipped (complete partitions and air changing)	11/13/39 to 7/29/40	46	8	17
First open control	11/13/39 to 7/29/40	34	17	50
Second open control	3/1/40 to 7/29/40	23	12	52

TABLE 3.—*Severity of Infections in Ultraviolet Equipped and Open Control Rooms*

Type of Room	Date	Severe	Moderate	Mild	Pyrexia
Ultraviolet equipped (complete partitions and air changing)	11/13/39 to 7/29/40	0	5	1	2
First open control	11/13/39 to 7/29/40	3	8	3	3
Second open control	3/1/40 to 7/29/40	2	3	4	3

TABLE 4.—*Number of Infections in Ultraviolet Equipped, Partitioned and Open Control Room (July 29, 1940 to June 20, 1941)*

Type of Room	Number of Babies	Number of Babies Developing Infections	Percentage of Babies Developing Infections
Ultraviolet equipped (complete partitions and air changing)	56	12	21
Partitioned control	63	31	49
Second open control	60	36	60

TABLE 5.—*Severity of Infections in Ultraviolet Equipped, Partitioned and Open Control Rooms (July 29, 1940 to June 20, 1941)*

Type of Room	Severe	Moderate	Mild	Pyrexia
Ultraviolet equipped (complete partitions and air changing)	2	2	3	5
Partitioned control	9	10	9	3
Second open control	9	15	10	2

In this series the infants treated in the open control rooms had three times as many infections as those in the room equipped with ultraviolet lamps, and more of these infections were severe.

SERIES 2.—*Comparison of Infections Occurring in the (1) Ultraviolet Equipped, (2) Partitioned and (3) Open Control Rooms.*—The figures in table 3 show that the babies in the room equipped with ultraviolet lamps had definitely fewer infections than those treated in the open control rooms. Possibly the fewer infections in the room equipped with ultraviolet lamps were due to the partitions which were also present, and, in order to rule this out, partitions running up 8 feet from the flood were put in the control room, thus dividing it into six cubicles. The partitions were not run to the ceiling, which was 10 feet high, because artificial ventilation was not provided. There was only one sink in this room. The nursing personnel was still the same in this room as in the room equipped with ultraviolet lamps. This was called the partitioned control room (fig. 4).

The number of infections occurring in the room equipped with ultraviolet lamps, the partitioned control and the second open control room during the next eleven months are shown in table 4 and the severity of these infections in table 5.

More than twice as many infections occurred among the control babies as among those in the room equipped with ultraviolet lamps. The babies in the partitioned control room developed fewer infections than those in the second open control room. Partitions alone, therefore, seem to play some part in preventing these hospital infections. There were also fewer severe and moderate infections among the babies in the room with the ultraviolet lamps.

TABLE 6.—*Number of Infections* in Completely Partitioned Room with Air Conditioning, Partially Partitioned Room and Open Control Room (June 20, 1941 to April 6, 1942)*

Type of Room	Number of Babies	Number of Babies Developing Infections	Percentage of Babies Developing Infections
Completely partitioned with air-changing system	77	21	26
Partitioned control	71	26	37
Second open control	77	26	34

* During 1941-1942, fewer babies developed infections and hemolytic streptococci and pneumococci were isolated less frequently than during the year 1940-1941.

TABLE 7.—*Severity of Infections in Completely Partitioned Room with Air Conditioning, Partially Partitioned Room and Open Control Room (June 20, 1941 to April 6, 1942)*

Type of Room	Severe	Moderate	Mild	Pyrexia
Completely partitioned with air conditioning	4	7	9	1
Partitioned control	8	10	5	3
Second open control	9	9	6	2

SERIES 3.—*Comparison of Infections Occurring in Rooms with (1) Complete Partitions and Air Changing, (2) Partial Partitions and (3) No Partitions.*—The room equipped with ultraviolet lamps also had complete partitions and an air changing system, both of which the control rooms lacked. In order to determine what part the complete partitions and air changing had in the results obtained, the ultraviolet lamps were turned out and for the next nine months the number of infections occurring (1) in the room with complete partitions and air changing, (2) in the room with partial partitions and (3) in the second open control room were compared. The results are shown in table 6 and the severity of these infections in table 7.

There were slightly fewer infections occurring in the room with the complete partitions and the air changing system than in the partially partitioned and the second open control room. The difference, however, was slight.

The much better infection records of the babies in the room equipped with ultraviolet lamps, completely partitioned and air changed, in the first two series were therefore almost entirely due to the ultraviolet radiation barriers.

EVIDENCE OF TRANSFER OF BACTERIA

1. *Bacteriologic Investigation of Upper Respiratory Tract.*—Cultures of both tonsillar areas and the posterior pharyngeal wall were taken of each infant on admission and at weekly intervals throughout his stay in the hospital. Nasal cultures were also taken if any nasal discharge was present. Frequent cultures (usually daily) were taken of any baby who showed a rise in temperature or signs of infection of the upper respiratory tract. Cultures were also taken whenever possible of any other infected areas. The throats of the staff, interns and nurses were swabbed as a routine once a week and whenever any respiratory infection developed.

The cultures were planted as soon as possible on moist human blood agar plates and incubated in an atmosphere of approximately 10 per cent carbon dioxide at 37.5 C. for eighteen hours.[5] Colonies suspected of being pneumococci or hemolytic streptococci were picked to fresh plates for isolation. The pneumococci were identified by the bile solubility test and typed by agglutination. The hemolytic streptococci which fell into group A (Lancefield [6]) were typed.[7] To determine the group to which the strain belonged a method combining the technics of Fuller [8] and Brown [9] was used. The typing serums [10] were prepared according to the method of Mueller and Klise,[11] and the technic of Neisser [12] was used in the preparation of the antigen for agglutination.

Over a period of twenty-nine months cultures were taken of 674 babies. Sixty-seven strains of group A hemolytic streptococci (all but seven of which were typable) and one hundred and four strains of pneumococci were isolated. Cultures were taken of 291 members of the staff. These yielded seventy-five strains of group A hemolytic streptococci (all but seven of which were typable) and thirty strains of pneumococci. If the same type was recovered more than once from an individual it was counted as only one in the figures given. If a person had two different types of streptococci (always on different days) this was counted as two. In all, 4,356 cultures, the great majority of which were from throats, were taken.

The interns and nurses frequently carried hemolytic streptococci, usually without any symptoms of infection. These organisms were rarely recovered from cultures taken of the staff physicians. The carrier rate reached a peak during the late winter months and fell to practically zero during the summer. The prevalent type of streptococcus differed from time to time. For instance, toward the end of 1940 type 3 was very common and types 12 and 5 were only occasionally encountered. In the next three months type 3 persisted with fair frequency but type 12 became very common. A few weeks later type 5 became very prevalent and type 12 almost disappeared. Both streptococci and pneumococci were carried for months without any apparent ill effects. One intern harbored hemolytic streptococcus type 10 from December 1939 until June 1940, when he left the hospital. Another intern carried pneumococcus type XIX for over a year. This was the most common type of pneumococcus encountered, and this intern may possibly have been the source of infection of 2 infants in the open control room.

Of the two hundred and seventy-six strains of group A hemolytic streptococci and pneumococci which were isolated, only eighteen were passed from baby to baby, from staff to baby or from baby to staff. Therefore according to our technic this is a rare occurrence. One such transfer occurred in the room equipped with ultraviolet lamps, two in the open control room, six in the partitioned control room (partial partitions) and nine in the second open control room. These are shown in table

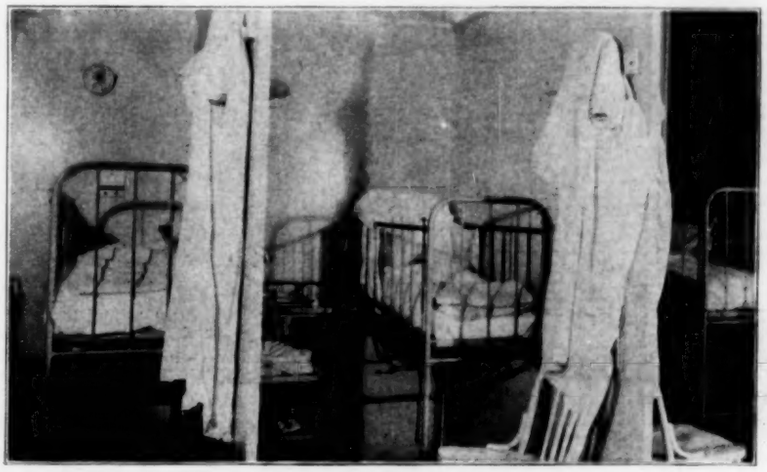

Fig. 4.—Half of the partitioned control room.

TABLE 8.—*Transfer of Organisms*

Type of Room	Date	From Baby to Baby	From Staff to Baby	From Baby to Staff	Total
Ultraviolet equipped (complete partitions and air changing)	November 1939 to June 1941 (19 mos.)	0	1	0	1
Partitioned control	August 1940 to April 1942 (21 mos.)	3	1	2	6
First open control	November 1939 to August 1940 (9 mos.)	0	2	0	2
Second open control	March 1940 to April 1942 (25 mos.)	6	3	0	9
Complete partitions and air changing	June 1941 to April 1942 (10 mos.)	0	0	0	0
Total		9	7	2	

8. Transfer from baby to baby is the commonest mode of spread, and this appears to occur most frequently in the open control rooms, although the figures are so

5. Auger, W. J.: A New Method of Culturing Sputum on Solid Media Using Carbon Dioxide for the Isolation of Pneumococci, Brit. J. Exper. Path. **20:** 439 (Dec.) 1939.

6. Lancefield, Rebecca C.: A Serological Differentiation of Human and Other Groups of Hemolytic Streptococci, J. Exper. Med. **57:** 571 (April) 1933.

7. Griffith, F.: The Serological Classification of Streptococcus Pyogenes, J. Hyg. **34:** 542 (Dec.) 1934.

8. Fuller, A. T.: The Formamide Method for Extraction of Polysaccharides from Hemolytic Streptococci, Brit. J. Exper. Path. **19:** 130 (April) 1938.

9. Brown, J. H.: A Simplified Method for Grouping Hemolytic Streptococci by the Precipitin Reaction, J. A. M. A. **111:** 310 (July 23) 1938.

10. Drs. Frieda Fraser and Helen Plummer of the Connaught Laboratories, University of Toronto, supplied the type cultures.

11. Mueller, J. H., and Klise, K. S.: A Method for the Agglutination of Hemolytic Streptococci, J. Immunol. **22:** 53 (Jan.) 1932.

12. Neisser, Hedwig: The Serological Typing of Streptococcus Pyogenes and Its Application to Certain Infective Conditions, J. Path. & Bact. **48:** 55 (Jan.) 1939.

small that no definite conclusion is justifiable. Two instances of the transfer of organisms are reported here:

1. Baby F. was admitted to the second open control room on October 7. No pathogenic organisms were found in his cultures until November 13, when a pure culture of type VI pneumococcus was isolated from his nose. The original source of this organism is not known. On November 20, Baby McC., who was in the same room, showed the presence of pneumococcus type VI in his throat culture. Baby McC. had been in this room for six weeks and had never previously shown this organism. On November 26 Baby T., who had been in the same room nearly a month, developed an upper respiratory infection with type VI pneumococcus. Again this organism had not previously been found in his throat. The last two babies were evidently infected from Baby F.

2. Baby G. was admitted on February 4 to the partitioned (partial partitions) control room and carried pneumococcus type XIX in his throat until his discharge on March 16. Baby H., who had been in the same room for three weeks, developed a respiratory infection on February 6 and type XIX pneumococci were cultured from his throat on February 16 and 23 and March 2, which he apparently acquired from Baby G.

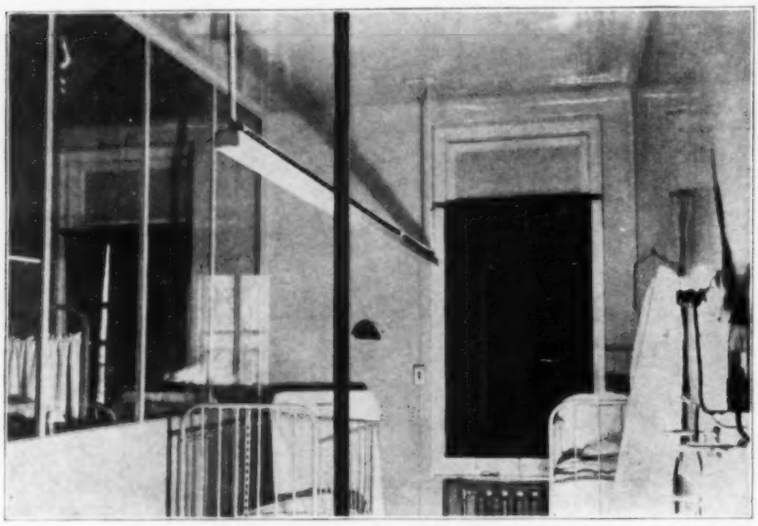

Fig. 5.—Room with ultraviolet irradiation of upper air.

Baby L., after more than five weeks in this room, contracted a type XIX infection on February 21, presumably from Baby G. or Baby H.

In these studies 506 babies have been under observation and 188, or 37 per cent, of these contracted clinical infections. In only 16, or about 10 per cent of these, did we obtain evidence that these infections were due to bacteria. Assuming that the bacteriologic examinations were made sufficiently frequently, one would infer that virus infections were responsible for much of the disease of the upper respiratory tract encountered. Wells [13] and also Andrewes and Glover [14] have studied experimental air borne virus infection in ferrets. Wells [15] and Greene, Barenberg and Greenberg [16] have described epidemics of virus diseases which were apparently air borne and which were controlled by ultraviolet radiation of the air.

2. Presence of Organisms in the Air.—Counts were also made on numerous occasions from September 1940 to April 1942 of the number of bacteria in the air of the experimental rooms. Blood agar plates were exposed for varying periods of time simultaneously in all three rooms, and 10 cubic feet samples of air were taken with the Wells air centrifuge. The average counts are shown in tables 9 and 10.

TABLE 9.—*Bacteria in Air (September 1940 to June 1941)*

	Ultraviolet Equipped Room	Partitioned Control Room	Second Open Control Room
Blood agar plates: number of colonies per plate (average)....	109	288	264
Wells centrifuge: number of colonies per 10 cu. ft. (average)	99	121	163

In table 9 it is seen that the plates exposed in the control rooms showed more than twice as many organisms as those exposed in the room equipped with ultraviolet lamps. The Wells centrifuge counts also showed that the air in this room contained fewer organisms.

From table 10 it is evident that there is no significant difference between the air bacterial counts made in the completely partitioned room with air changing, the partially partitioned control room and the open control room.

RESULTS OF ULTRAVIOLET IRRADIATION OF THE UPPER AIR IN ROOMS

Encouraged by the previous results, a simpler method of indirect irradiation was tried out in three smaller rooms (12 by 8 by 10 feet). Three 36 inch 30 watt General Electric Germicidal lamps were hung in an aluminum reflector trough down the center of the room 3 feet, 3 inches from the ceiling (see figure 5). The rays were deflected upward and provided a reservoir of clean air near the ceiling. No direct rays from the lamps reached the patients or the nurses and therefore precautions were not necessary to avoid burning of the skin or eyes. One of these rooms which usually contained four infants' cots or three larger cribs is shown in figure 5. One of these rooms was used exclusively for premature babies and will be discussed later. The other two rooms, with similar control rooms without the ultraviolet lamps, were used for babies up to 2 years of age. In these rooms it was not possible to admit only babies free from respiratory infection. Many were admitted with such infections and discharged within a short time. Unless the infant remained in the hospital for two weeks following his recovery from his respiratory infection he was not included in these records. The doors

TABLE 10.—*Bacteria in Air (June 1941 to April 1942)*

	Completely Partitioned Room with Air Changing	Partially Partitioned Control Room	Second Open Control Room
Blood agar plates: number of colonies per plate (average)....	134	193	116
Wells centrifuge: number of colonies per 10 cu. ft. (average)	58	68	76

13. Wells, W. F., and Henle, W.: Experimental Air Borne Disease: Quantitative Inoculation by Inhalation of Influenza Virus, Proc. Soc. Exper. Biol. & Med. **48**: 298 (Oct.) 1941.

14. Andrewes, C. H., and Glover, R. E.: Spread of Infection from the Respiratory Tract of the Ferret: I. Transmission of Influenza A Virus, Brit. J. Exper. Path. **22**: 91 (April) 1941.

15. Wells, W. F.; Wells, Mildred W., and Wilder, T. S.: The Environmental Control of Epidemic Contagion: I. An Epidemiologic Study of Radiant Disinfection of Air in Day Schools, Am. J. Hyg. **35**: 97 (Jan.) 1942.

16. Greene, David; Barenberg, L. H., and Greenberg, Bernard: Effect of Irradiation of the Air in a Ward on the Incidence of Infections of the Respiratory Tract with a Note on Varicella, Am. J. Dis. Child. **61**:273 (Feb.) 1941.

and windows were frequently left open to improve the ventilation, and therefore the conditions in these rooms varied considerably. The clinical results in these rooms are shown in tables 11 and 12.

It is obvious that the ultraviolet lamps in these rooms did not reduce the spread of cross infection. The custom of leaving the corridor door open, resulting in a rapid movement of air past the ultraviolet lamps, may have been a factor in the unsatisfactory results.

Premature Rooms.—A room used exclusively for 3 or less premature infants was also equipped with three General Electric Germicidal lamps as described. The temperature was kept between 77 and 85 F. and the humidity at about 50 per cent. The doors and windows were always kept closed. A similar room without the lamps was used as a control. The same nurses worked in the two rooms. The number of infections occurring in these two rooms is shown in table 13.

TABLE 11.—*Number of Infections in Rooms with Indirect Irradiation and Control Rooms (March 1941 to March 1942)*

Type of Room	Number of Babies	Number of Babies Developing Infections	Percentage of Babies Developing Infections
Ultraviolet equipped with indirect radiation	58	22	38
Control	64	22	34

TABLE 12.—*Severity of Infections in Rooms with Indirect Irradiation and Control Rooms (March 1941 to March 1942)*

Type of Room	Severe	Moderate	Mild	Pyrexia
Ultraviolet equipped with indirect irradiation	6	11	2	3
Control	5	9	6	2

TABLE 13.—*Number of Infections Among Premature Babies in Rooms with Indirect Irradiation and Control Rooms (March 1941 to March 1942)*

Type of Room	Number of Babies	Number of Babies Developing Infections	Percentage of Babies Developing Infections
Ultraviolet equipped with indirect irradiation	28	8	29
Control	24	12	50

The premature babies in the control room had nearly twice as many infections as those in the room equipped with ultraviolet lamps. Unfortunately a small number of babies were admitted to these cubicles during the year owing to their long stay in the hospital. While the numbers are not large enough to draw definite conclusions, this method of irradiation reduced considerably the spread of cross infections among the premature infants.

Routine throat cultures of the children in these three rooms and their controls were made from April 12 to June 26, 1941. No bacteriologic evidence of the spread of pathogenic organisms from one to another was encountered. However, in February 1942, in a special investigation undertaken when 2 of 3 premature infants in the control room developed severe respiratory infections on the same day, throat cultures were taken of these infants and the staff attending them. Cultures from both sick babies showed hemolytic streptococcus type 3, and pneumococcus type VI was isolated from 1 of them as well. An intern attending these babies showed a heavy growth of hemolytic streptococcus type 3 in her throat culture at this time, and it may be presumed that the 2 infants acquired their streptococcic infection from her. A nurse who had come on duty in the room when the infants were showing the first signs of the infection had a slight sore throat when cultures were taken five days later, and at this time many colonies of pneumococci type VI were isolated from her. The nurse may have been responsible for the pneumococcus type VI isolated from the infant or, conversely, she may have acquired it from him. The patient infected with only hemolytic streptococcus type 3 died.

TABLE 14.—*Severity of Infections Among Premature Babies in Rooms with Indirect Irradiation and Control Rooms (March 1941 to March 1942)*

Type of Room	Severe	Moderate	Mild
Ultraviolet equipped with indirect irradiation	0	4	4
Control	4	4	4

BACTERIA IN THE AIR IN ROOMS WITH IRRADIATION OF THE UPPER AIR AND CONTROL ROOMS

The air in the irradiated rooms used for older infants contained as many bacteria as the air of the corresponding control rooms. In the rooms used for the premature infants the results are shown in table 15.

It is evident that the premature infants in the control rooms were exposed to three to four times as many air borne organisms as those in the irradiated rooms.

CONCLUSIONS

1. Infants treated in open six bed rooms or in a room with 8 foot partitions between the infants developed two to three times as many respiratory infections as babies in a room divided into cubicles with partitions running to the ceiling, a curtain of ultraviolet radiation across their entrances and an air changing system.

2. When the ultraviolet lamps were turned off and the progress of the babies in this room, which had complete partitions and an air changing system, was compared with that of other babies in the room with partial partitions, it was found that those in the latter room had only slightly more infections.

3. The curtains of ultraviolet radiation between the babies were therefore the major factors in the decided reduction of respiratory cross infections described in conclusion 1.

TABLE 15.—*Bacteria in Air in Rooms with Indirect Irradiation and Control Rooms (Premature Infants)*

	Indirect Ultraviolet Irradiation	Control Room
Blood agar plates: number of colonies per plate (average)	46	197
Wells centrifuge: number of colonies per 10 cu. ft. (average)	22	63

4. Two hundred and seventy-six strains of group A hemolytic streptococci and pneumococci were recovered from the staff and the babies. In only 18 instances was the transfer of these organisms from patient to patient, from staff to patient or vice versa demonstrated.

5. Infants treated in rooms in which the upper air was irradiated showed approximately the same number of infections as babies treated in rooms similar but with-

out ultraviolet irradiation. The doors and windows in these rooms were frequently left open.

6. Premature infants treated in the regular premature room had nearly twice as many respiratory infections as similar infants in a room in which the upper air was irradiated. The doors and windows were kept closed in these rooms.

7. During the last two and one-half years the progress of 682 babies has been followed. Two hundred and fifty-eight, or 38 per cent, have developed respiratory infections, many of which were mild.

67 College Street.

VITAMIN B_1 THERAPY IN DIABETIC NEURITIS

WILLIAM NEEDLES, M.D.
NEW YORK

In a previous article [1] an attempt was made to determine the relationship, if any, between states of vitamin B_1 deficiency and diabetic neuritis. For this purpose a quantitative study of the vitamin B_1 content of the diet of patients with diabetic neuritis was made and found to be quite adequate, as judged by the Cowgill formula. The evidence, clinical and pathologic, in favor of a vascular etiology in diabetic neuritis was mentioned, but the possibility that avitaminosis nevertheless played a role in producing the neuritic syndrome was not ruled out, since defective absorption or utilization of the ingested vitamin had still to be considered. Further evaluation of these factors, it was stated at that time, was not feasible until tests for the metabolism of vitamin B_1 had been elaborated. Since then such a test has been introduced, and the results it has yielded will be discussed here.

The present study represents an attempt to tackle the problem of the relationship between avitaminosis and diabetic neuritis from a different angle, by observing the effects of vitamin B_1 therapy on the neurologic picture. Eleven cases were included at the outset, but in 4 of these cooperation was not sufficiently satisfactory to allow of regular and prolonged follow-up. A neurologic examination was made in each of the other 7 cases before therapy was instituted, then 10 to 15 mg. of thiamine hydrochloride was given daily, and examinations were made again at intervals of a month. The average period of observation extended for five and a half months. The salient features of these cases are now presented:

REPORT OF CASES

CASE 1.—A. L., a man aged 69, who entered the Mount Sinai Hospital on Jan. 28, 1941, had been found to have diabetes mellitus five years previously, and it had been controlled by dieting. In October 1940 he began to complain of weakness and numbness of the hands. Shortly thereafter progressive weakness of the legs and paresthesias in the feet set in. During the period from Oct. 3 to Nov. 12, 1941 he received, according to his private physician, 28 cc. of thiamine hydrochloride, half intravenously and half intramuscularly, each cubic centimeter equal to 0.0333 Gm.; eight injections of concentrated liver extract; four injections of 1 cc. of a vitamin B preparation, each cubic centimeter equal to 0.006 Gm. of thiamine hydrochloride, 0.050 Gm. of nicotinamide, 0.0001 Gm. of riboflavin and 0.0001 Gm. of vitamin B_6. Orally the patient received six tablets of yeast concentrate daily.

The physical examination disclosed cardiac enlargement and a systolic murmur at the apex of the heart. There was moderate sclerosis of the blood vessels. The blood pressure was 148 mm. of mercury systolic and 88 diastolic.

Neurologic examination showed a shuffling gait and a positive Romberg sign; there was slight ataxia in all limbs; motor power was impaired in the upper and lower limbs; the arms and forearms showed some atrophy; the biceps, radial and ulnar reflexes and the patellar and ankle jerks were absent; the abdominal and premasteric reflexes were absent; there were fibrillations in the muscles of the calf; pain, touch and temperature sensation were diminished over the lower limbs, the hands and forearms; vibration was diminished in the upper and lower limbs, and position sense was impaired in the fingers and toes. The muscles were tender to pressure.

The blood sugar was 230 mg. per hundred cubic centimeters. The blood count and blood Wassermann reaction were negative. Free hydrochloric acid was present in the gastric analysis. The cerebrospinal fluid showed a 4 plus Pandy reaction and a total protein of 192 mg. per hundred cubic centimeters; the dynamics were normal. Roentgen examination disclosed calcification in both posterior tibial arteries.

A tolerance test for vitamin B_1 was carried out but proved unsatisfactory owing to the fact that the patient had been receiving massive doses of the vitamin.

The condition was considered one of diabetic neuritis with some evidence of involvement of the spinal cord in addition.

On a diet of 100 Gm. of carbohydrate, 80 Gm. of protein and 80 Gm. of fat the urine was free of dextrose.

He was given five tablets of yeast every four hours and 30 mg. of thiamine hydrochloride intramuscularly every day. A week after this regimen there was diminution in tenderness of the muscles, but no other change in the neurologic status. He continued to receive thiamine hydrochloride 30 mg. a day orally after leaving the hospital. Neurologic examination at monthly intervals for a period of eight months disclosed no significant alteration in the findings. Weakness was more apparent and paresthesias persisted.

CASE 2.—B. M., a woman aged 54, was observed in the diabetic clinic of the hospital in 1935, when diabetes mellitus was detected. Since that time the diabetes had been controlled by dietary regulation plus 10 or 20 units of insulin daily. She was admitted to the hospital in July 1938, at which time she showed moderate sclerosis of the blood vessels and a blood pressure of 110 systolic and 74 diastolic. The neurologic examination disclosed a somewhat broad based gait; there was some ataxia in the left lower limb; the right ankle jerk was feeble, the left ankle jerk, the hamstring reflexes and the reflexes in the upper limbs were not elicited; there was a glove and stocking distribution of hypalgesia; vibratory sense was absent at the knees and the left iliac crest, diminished at the feet and in the hands; position sense was impaired at the toes. She was considered to have diabetic neuritis.

When observed in the hospital in May 1939 her blood pressure was 180 systolic and 110 diastolic and she presented evidence of hypertensive and arteriosclerotic heart disease, as well as diabetes mellitus and diabetic neuritis.

A tolerance test for vitamin B_1 performed some time later yielded figures slightly below normal.

A neurologic examination in June 1941 disclosed the following positive findings: The deep reflexes in the upper limbs were absent; the ankle jerks were absent, even with reenforcement; there was bilateral calf tenderness; pain, touch and temperature sensation were diminished below the middle of the legs; vibration sense was diminished at the feet and knees and absent at the iliac crests. Subjectively the patient complained of pains in the legs and a sensation of heaviness in the feet and hands. She was placed on the usual amounts of thiamine hydrochloride.

Periodic examination up to December 1941 showed no essential changes in the objective neurologic findings. The patient stated that she felt stronger generally and that the paresthesias were less troublesome. Tenderness of the calves persisted and was well defined.

From the Neurological Service of Dr. I. S. Wechsler, Mount Sinai Hospital.

1. Needles, William: Vitamin Studies in Cases of Diabetic Neuritis, Arch. Neurol. & Psychiat. **41**: 1222 (June) 1939.

CASE 3.—M. C., a woman aged 54, was discovered to be suffering from diabetes mellitus in October 1940. The diabetes had subsequently been controlled by dietary measures. A sensation of heaviness in the hands had appeared about six months prior to October 1940. The physical examination showed a blood pressure of 170 systolic and 100 diastolic; the second aortic sound was accentuated. Roentgen examination disclosed several calcified plaques in the right posterior tibial artery. A tolerance test for vitamin B_1 yielded normal results.

Neurologic examination in April 1941 showed that tenderness of the calves was present; the knee jerks were depressed but fairly lively after reenforcement; the ankle jerks were absent even with reenforcement; pain, touch and temperature sensation were diminished over the lower two thirds of the legs and the feet and over the hands; vibratory sensation was diminished at the feet and knees.

Therapy with thiamine hydrochloride was instituted June 1941 and the neurologic status was checked periodically up to December 1941. The objective findings remained in statu quo in all essential details; tenderness of the calves was diminished, however, and the paresthesias were less apparent.

CASE 4.—S. B., a woman aged 38, observed at the Mount Sinai Hospital in January 1941, had been suffering for several years from diabetes mellitus, which had been controlled by dietary measures. For the past year she had developed cramps in the legs when walking and tingling sensations in the toes. There was also a history of "hysterical" attacks of crying and screaming, and of nervousness since 1936. In 1940 menopausal symptoms had set in. The general physical examination at this time disclosed no significant findings. The patient was, however, emotionally unstable and very querulous. The neurologic examination showed absence of deep reflexes in the lower limbs; vibratory sense was diminished up to a level of the midlumbar spine. The blood sugar determination was 175 mg. per hundred cubic centimeters. The urine was free of dextrose. The cerebrospinal fluid was normal. Free hydrochloric acid was present in the gastric contents.

A tolerance test for vitamin B_1 showed normal excretion.

The diabetes mellitus was controlled by a diet of 150 Gm. of carbohydrate, 60 of protein and 80 of fat, with 20 units of insulin daily. Neurologic examination in June 1941 showed absence of the knee and ankle jerks; vibratory sensation was lost at and below the iliac crests, diminished at the hands and wrists; moderate tenderness of the calf muscles was present; cutaneous sensibility was difficult to evaluate, there being an inconstant glove and stocking type of diminution; there was a tendency to veer in walking, and the Romberg test was positive when the eyes were closed. In view of the history of a psychoneurotic disorder and the reaction of the patient during the examination, a psychogenic basis for some of the abnormal findings could not be ruled out.

Treatment with thiamine hydrochloride was instituted and the patient was observed at monthly intervals up to January 1942. The neurologic findings, those which allowed of a psychogenic interpretation as well as those that did not, remained unaltered. Tenderness of the calf muscles persisted as heretofore. The paresthesias continued, but in a milder form.

CASE 5.—S. S., a woman aged 22, who developed diabetes mellitus at the age of 8 years, had been under constant observation at the hospital since that time. The diabetes was originally controlled by a diet of 65 Gm. of protein and 100 Gm. of fat. Later she received 100 Gm. of carbohydrate, 60 Gm. of protein and 60 Gm. of fat with 50 units of insulin daily. She was admitted to the hospital in December 1939 after a convulsive episode.

The general physical examination disclosed no significant findings. The blood pressure was 120 systolic and 90 diastolic. The blood count was normal. The urine contained 6 per cent of dextrose. The blood sugar was 155 mg. per hundred cubic centimeters. The spinal fluid and the electroencephalogram were normal. Roentgen study of the skull was normal. Neurologic examination showed absence of the right and diminution of the left ankle jerk; the knee jerks were diminished; the pupils were irregular, but equal and reactive; the fundi showed a few retinal hemorrhages and evidence of diabetic choroiditis. The neurologic examination four months later showed the ankle jerks to be depressed and the knee jerks present only with reenforcement. In November 1940 the patient complained of tingling sensations in the hands and feet.

A tolerance test for vitamin B_1 showed normal figures.

Neurologic examination in June 1941 showed that the left knee jerk and both ankle jerks were absent, even with reenforcement; the right knee jerk was absent but fairly active with reenforcement; there was tenderness of the calf muscles; the right pupil was ovoid and was feeble in response to light stimulation.

Therapy with thiamine hydrochloride was instituted and the patient observed until October 1941, after which time she failed to cooperate. When last examined she did not feel subjectively improved. Tenderness of the calf muscles was exquisite. The paresthesias persisted. The knee and ankle jerks were absent, even with reenforcement; pain, touch and temperature sensations were diminished below the ankles; vibratory sensation was diminished at the ankles and toes. There was evidence of progression of the neurologic syndrome during the period of thiamine hydrochloride therapy.

CASE 6.—M. L., a woman aged 58, was discovered to have diabetes mellitus in June 1941. For the preceding year she had suffered from weakness of the legs, paresthesias in the feet and pain in the calf muscles on walking. The general physical examination disclosed enlargement of the heart toward the left and a systolic murmur at the apical and aortic regions. The blood pressure was 182 systolic and 110 diastolic. A blood Wassermann test was negative. The diabetes was controlled by a diet of 120 Gm. of carbohydrate, 80 Gm. of protein and 100 Gm. of fat with 10 units of insulin daily.

Neurologic examination in July 1941 showed that the knee jerks were decidedly depressed, even with reenforcement; the ankle jerks were feebly obtained but fairly normal with reenforcement. Vibratory sensation was diminished at the hands, feet and knees. The calf muscles were exquisitely tender. The patient was observed under a regimen of thiamine hydrochloride until December 1941. The paresthesias had disappeared; tenderness of the calf muscles was diminished; the reflex and objective sensory disturbances remained unaffected.

CASE 7.—W. B., a man aged 47, admitted to the Mount Sinai Hospital in September 1941, had been discovered to have diabetes mellitus eighteen months prior, and it had been controlled by a diet of 180 Gm. of carbohydrate, 80 Gm. of protein and 80 Gm. of fat with 40 units of protamine zinc insulin every morning. Since July 1941 he had been troubled with pains in the legs and peculiar sensations in the feet and hands. The physical examination showed peripheral arteriosclerosis; there was a systolic apical murmur; the blood pressure was 110 systolic and 80 diastolic; the right dorsalis pedis artery was not palpable; there was bilateral purulent otitis media. Neurologic examination disclosed the middle ear type of deafness bilaterally; all deep reflexes were absent or greatly depressed; the abdominal and cremasteric reflexes were absent; there was tenderness of the calf muscles; hypalgesia of the glove and stocking distribution was present; vibratory sense was diminished in the lower limbs; diabetic retinopathy was evident in the fundi. The blood count, the blood Wassermann reaction and the cerebrospinal fluid findings were normal. The urine showed a trace of dextrose. The blood sugar was 85 mg. per hundred cubic centimeters.

Soon after admission to the hospital he was given 50 mg. of thiamine hydrochloride intramuscularly every day. The neurologic condition after two weeks of this regimen showed no improvement. Oral administration of the vitamin was continued after his discharge from the hospital. In November 1941 he showed no improvement either subjectively or objectively. Pain and weakness of the limbs persisted, the deep reflexes were absent and the cutaneous and vibratory sensory disturbances remained unaltered.

Four other cases could not be utilized because of faulty cooperation. In two of them the tolerance test for vitamin B_1 was carried out and in each case the results were normal.

COMMENT

A survey of this group of cases leads to the conclusion that no amelioration of the neurologic syndrome was demonstrable objectively. In 2 of the 7 cases there was an increase in the neurologic involvement despite therapy with thiamine hydrochloride. Subjective improvement apparently occurred in 4 of the cases in that the weakness and the paresthesias remitted. Tenderness of the muscles of the calf was far from uniformly relieved.

These findings are distinctly at variance with those reported by Fein, Ralli and Jolliffe [2] after a similar study. These observers found significant improvement in all of their 9 cases; tenderness of the calf disappeared, the ankle jerks were restored and vibratory sensation reappeared following therapy with thiamine hydrochloride. They therefore concluded that B_1 avitaminosis was the responsible factor in the production of the neuritic syndrome. Quantitative estimation of the vitamin B_1 content of the diet of their patients showed it to be well above the minimal requirement, substantiating in this respect my original findings. However, the therapeutic response of their patients to thiamine leads them to postulate that their patients indulged in dietary indiscretions to the degree that the adequate vitamin-caloric ratio no longer obtained. It should be pointed out that they concede at least a contributory role in the pathogenesis to vascular disease when they state that, owing to compromise of the blood supply to the peripheral nerves, a greater intake of vitamins might be needed to supply the tissues adequately than would otherwise be the case.

In seeking a possible explanation for the response to thiamine hydrochloride in their cases and the failure of the response in the present series, one feature claims attention. The degree of neurologic involvement was slighter in their group. In none of their cases were the knee jerks affected; in none were there significant disturbances of the cutaneous sensory modalities. One might contend that in these instances the disease process was milder, while in my group of cases it had produced irreversible and irreparable damage. The situation would then be similar to that in subacute combined degeneration of the spinal cord in pernicious anemia, in which therapy with liver is much more effective in preventing the onset of the condition than in clearing up neurologic signs that have already set in. This explanation would not, however, account for the progression that occurred in 2 cases of the series in which ample doses of thiamine were administered.

There are certain other considerations, moreover, which militate against an avitaminotic etiology in diabetic neuritis. Pollack, Ellenberg and Dolger [3] have recently evolved a tolerance test for vitamin B_1. They established that normally, after an intramuscular injection of 0.001 Gm. of thiamine hydrochloride, over 180 micrograms is excreted in the urine within four hours, while in cases of vitamin deficiency less than this amount is excreted. The excretion rate of patients with diabetes mellitus in the vast majority of instances was normal; in only 13 out of 139 cases was the excretion level below normal; the percentage of cases with low excretion levels was smaller than in a large group of unselected patients. A normal level of excretion is indicative of adequate absorption and utilization of the vitamin.[4] At this point it should be recalled that in 6 of my cases a tolerance test for vitamin B_1 was carried out. In 1 the excretion was found slightly below normal; in the others normal figures were obtained.

Street and his co-workers [5] found that a diet chronically deficient in vitamin B_1 will produce neurologic changes that are irreversible. They maintained dogs for three hundred and fifty-four days on a subminimal, partially deficient diet until neurologic signs of peripheral neuritis developed. They then administered large doses of vitamin B_1 for a month. No significant changes occurred. Postmortem examination showed involvement of the peripheral nerves and anterior roots as well as of the posterior column of the spinal cord. They draw a distinction between acute and chronic disease from vitamin deficiency: in the former vitamin therapy restores the animal to a normal condition within a few hours, presumably because the nervous disorder is merely functional; in the latter, permanent irremediable damage to the nervous structures results. Since dietary deficiency in man is much more likely to be partial than complete, they consider an experimental study of partial deficiency to resemble more closely the condition in man. This would certainly appear to be applicable to cases of diabetic neuritis, in which no sudden curtailment of diet occurs. So that, theoretically at least, no improvement of a diabetic neuritis presumably due to B_1 avitaminosis is to be expected from vitamin therapy.

The conclusions to be drawn from this study may appear unduly nihilistic. Hence I would add that in the present state of our knowledge no inferences drawn from the laboratory, no matter how cogent they may appear, should outweigh empirical findings at the bedside. Further study of diabetic neuritis, particularly in the less advanced phase and with the benefit of the recently devised tests for vitamin B_1 metabolism, should establish whether avitaminosis is a decisive factor, operating in all cases, or merely a coincidental factor to be found in some cases.

CONCLUSIONS

Seven cases of diabetic neuritis were studied before and after therapy with thiamine hydrochloride. In none was any improvement noted; in 2 progression of the neurologic syndrome occurred.

Evidence indicates that in diabetic neuritis the metabolism of vitamin B_1 does not vary significantly from the normal.

70 East Eighty-Third Street.

2. Fein, H. D.; Ralli, Elaine P., and Jolliffe, Norman: Peripheral Neuropathy Due to Vitamin B_1 Deficiency in Diabetes Mellitus, J. A. M. A. **115**: 1973 (Dec. 7) 1940.

3. Pollack, Herbert; Ellenberg, Max, and Dolger, Henry: Clinical Studies on Vitamin B_1 Excretion Determined by the Fermentation Method, Arch. Int. Med. **67**: 793 (April) 1941.

4. Pollack, Herbert: Personal communication to the author.

5. Street, H. R.; Zimmerman, H. M.; Cowgill, G. R.; Hoff, H. E., and Fox, J. C.: Some Effects Produced by Long-Continued Subminimal Intakes of Vitamin B_1, Yale J. Biol. & Med. **13**: 293 (Jan.) 1941.

Digestive Time of Food.—The digestion time of various foods is of the greatest importance because clinically many diseases manifest themselves by a delay or definite arrest in the evacuation of food from the stomach. We can ascertain much regarding motor function by gastric analysis. Not only do we observe the degree of food chymification as an index of gastric peristaltic function, but we also determine the evacuation time as a measure of the length of time necessary for the stomach to do its work. We can do this in two ways; either we can perform a complete fractional analysis throughout the entire digestion period or we can pass the tube at a stated interval after which a certain meal is normally digested, noting whether or not the stomach is empty or whether there is an actual delay. —Rehfuss, Martin E.: Indigestion: Its Diagnosis and Management, Philadelphia, W. B. Saunders Company, 1943.

STUDIES ON THE ACTION OF QUINIDINE IN MAN

II. INTRAMUSCULAR ADMINISTRATION OF A SOLUBLE PREPARATION OF QUINIDINE IN THE TREATMENT OF ACUTE CARDIAC ARRHYTHMIAS

MELVIN I. STURNICK, M.D.
JOSEPH E. F. RISEMAN, M.D.
AND
ELLIOT L. SAGALL, M.D.
BOSTON

Soluble preparations of quinidine sulfate for parenteral administration have not been readily available. Quinine dihydrochloride has been administered intramuscularly or intravenously.[1] Dilute solutions of quinidine sulfate in dextrose or water [2] and even suspensions of quinidine sulfate tablets in hot water and hydrochloric acid [3] have been administered in emergencies, but there are important objections to these procedures.

The necessity for a soluble preparation of quinidine suitable for parenteral administration in treating acute cardiac arrhythmias is obvious, especially when the abnormal rhythm is associated with vomiting, collapse, unconsciousness or other conditions in which absorption from the gastrointestinal tract is uncertain or delayed. A prolonged search of the American market for a soluble preparation has been unsuccessful. The Cinchona Products Institute, however, suggested that such a product might be obtained by adding urea and antipyrine to quinidine hydrochloride according to the following formula:

	Gm. or Cc.
Quinidine hydrochloride	15
Antipyrine	15
Urea	20
Distilled water to make	100

So far as we have been able to ascertain, this preparation has not been used, although a similar solution of quinine has been employed in the treatment of specific infections.[4]

No difficulty was encountered in making this solution and, in contrast to other soluble forms of quinidine, the ingredients are readily available. The mixture results in a clear colorless solution with 0.15 Gm. of quinidine hydrochloride in each cubic centimeter. Sterilization is best carried out by passage through a Berkefeld filter, after which the solution can be stored in ampules or rubber stoppered bottles available for emergency use. After several months this solution, like all quinine solutions, turns brown. This change in color occurs even when protected from the light; it is said to be due to the formation of a relatively small amount of decomposition products and is not accompanied by any discernible change of potency or by adverse reactions.

The speed of response to intramuscular administration of this preparation in human subjects has been reported.[5] Our purpose in the present communication is to report observations in the treatment of 24 episodes of acute arrhythmias in a series of 20 consecutive patients.

MATERIAL AND METHODS

The clinical characteristics of the patients studied are presented in the accompanying table. Electrocardiographic tracings confirmed the diagnosis in each instance before therapy was instituted. The response to treatment was gaged by the change in the heart rate at the apex, by disappearance of shock and other symptoms associated with the arrhythmias, by improvement in the patient's general condition and, whenever indicated, by repeated electrocardiographic tracings. Blood pressure determinations were taken at frequent intervals.

Medication was administered intragluteally or in the lateral aspect of the thigh. The initial dose was 0.15 Gm. in 1 instance, 0.3 to 0.45 Gm. in 11 instances, 0.6 Gm. in 9, 0.75 Gm. in 2 and 1.05 Gm. in 1. In accord with the studies previously reported,[5] the response to this initial dose was observed for one and one-half to two and one-half hours. If the rhythm failed to revert to normal during this period, additional medication was administered. The size of subsequent doses was increased if only a slight or moderate response to the initial dose was observed.

RESULTS

The rhythm reverted to normal within three hours after medication in 15 of 24 instances (13 of 20 patients). In each instance the clinical response indicated that conversion to normal rhythm was due to this medication. This group included 5 instances of ventricular tachycardia, 9 of auricular fibrillation and 1 of auricular tachycardia. Nine of the patients had arteriosclerotic heart disease, 2 had rheumatic heart disease, 1 was a toxic reaction to medication and 1 was a postoperative reaction.

Causes of Failure to Respond.—In the remaining 9 instances the condition failed to respond to therapy. Three of these patients had sinoauricular tachycardia (cases 4, 5 and 11); no response to quinidine was expected in these cases. One patient with nodal tachycardia (case 9) died of pulmonary edema before the drug had had sufficient time to exert its beneficial action. In 1 instance (case 12) it is probable that the medication was repeated too infrequently to result in adequate cumulative effect. In 3 cases conversion to normal rhythm took place during the night and the time of transition was not observed. The remaining case (20) failed to respond to quinidine despite adequate dosage.

Optimum Size of Initial Dose.—The rhythm of only 1 of the 8 patients who received an initial dose of less than 0.45 Gm. reverted to normal within two hours after the administration of the one dose. The rhythm of 1 of 3 patients who received an initial dose of 0.45 Gm. reverted to normal on two occasions following this dose. The rhythm of 2 of the 9 patients who received an ini-

Mr. Harry Brass, Ph.G., helped in preparing the injectable quinidine.
From the Medical Research Laboratories of the Beth Israel Hospital and the Department of Medicine, Harvard Medical School.

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2. Hepburn, John, and Rykert, H. E.: The Use of Quinidine Sulfate Intravenously in Ventricular Tachycardia, Am. Heart J. **14**: 620 (Nov.) 1937. Wilson, F. N., and Wishart, S. W.: The Effects Produced by the Intravenous Injection of Quinidine and Other Drugs on the Mechanism of the Heart Beat, Tr. A. Am. Physicians **41**: 55, 1926. Maher, C. C.; Sullivan, C. P., and Scheribel, C. P.: The Effect upon the Electrocardiogram of Patients with Regular Sinus Mechanism of Quinidine Sulfate, Am. J. M. Sc. **187**: 23 (Jan.) 1934.

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5. Sagall, E. L.; Horn, C. D., and Riseman, J. E. F.: Studies on the Action of Quinidine in Man: I. Measurements of the Speed and Duration of the Effect of Oral and Intramuscular Preparations, Arch. Int. Med., to be published.

tial dose of 0.6 Gm. or more was converted to normal by this amount. Of the 15 patients whose rhythm reverted to normal within three hours after the administration of quinidine, 5 did not need more than a single injection. Three of these 5 patients received 0.6 to 0.75 Gm. and the other 2 patients received 0.33 and 0.45 Gm. It appears, therefore, that an initial injection of 0.45 to 0.6 Gm. is advisable.

Toxic Effects.—When the medication was given intragluteally or in the lateral aspect of the thigh, pain

Observations Made on Patients Treated

Case	Age and Sex	Blood Pressure	Type of Heart Disease	Past History of Arrhythmias	Symptoms								
					Palpitation	Dyspnea	Pulmonary Edema	Pain	Congestive Failure	Shock	Coma	Sweating	Vomiting
Paroxysmal Ventricular Tachycardia													
7* R. A.	♀ 70	170/80	Hypertensive and arteriosclerotic	Yes, type unknown	0	+	0	0	+	++	++	+	+
1 I. B.	♂ 66	115/70	Arteriosclerotic, recent infarct	None	0	0	0	+	0	0	0	+	0
15 L. O.	♂ 64	126/80	Arteriosclerotic, recent infarct	Unknown	0	+	0	+	0	+	0	0	0
3 K. S.	♂ 67	110/70	Arteriosclerotic, recent infarct	Yes, paroxysmal ventricular tachycardia	0	0	0	0	0	0	0	0	0
14 C. W.	♂ 69	Unknown	Arteriosclerotic, ? recent infarct	None	0	+	+	0	0	++	+	+	0
Nodal Tachycardia													
9 W. J.	♂ 68	110/70	Arteriosclerotic	None	+	+	+	0	0	+	0	+	0
Auricular Fibrillation													
8* M. G.	♀ 17	120/40	Rheumatic	?	+	+,	0	0	0	0	0	0	0
					+	+	0	0	0	0	0	0	0
					+	+	0	0	0	0	0	0	+
13 R. G.	♀ 60	150/90	Toxic reaction to sulfadiazine	None	+	0	0	0	0	0	0	0	0
12* E. L.	♀ 43	110/70	Rheumatic	Yes, paroxysmal auricular fibrillation	+	+	0	+	0	+	0	0	+
					+	+	0	+	0	+	0	0	0
7a* R. A.	♀ 70	170/80	Hypertensive	Yes	0	+	+	+	+	+	+	+	+
6 G. S.	♀ 68	.....	Arteriosclerotic bronchopneumonia	0	0	+	+	0	0	+	+	+	0
19 E. R.	♀ 66	160/90	Arteriosclerotic, old coronary	Fibrillation	++	0	0	0	0	+	0	+	0
17 A. K.	♂ 84	134/68	Arteriosclerotic	None	0	0	0	0	0	0	0	0	0
18 E. S.	♀ 35	140/80	Postoperative cholecystectomy	None	++	0	0	0	0	0	0	+	+
20 N. S.	♂ 75	.....	Arteriosclerotic pneumonia, ? myocardial infarction	None	0	+	0	0	0	+	+	+	0
Auricular Tachycardia													
2 S. G.	♀ 65	130/78	Unknown	Yes, paroxysmal	+	0	0	++	0	+	0	0	0
16 G. H.	♂ 60	100/55	Arteriosclerotic, ? recent infarct	None	+	+	0	+	0	++	0	++	0
10 J. K.	♂ 52	130/76	Metastatic carcinoma to heart	None	+	0	0	+	0	+	0	+	0
Sinoauricular Tachycardia													
4 M. G.	♂ 50	110/70	Arteriosclerotic, recent infarct	None	0	+	0	+	0	+	0	+	0
5 J. P.	♀ 42	100/75	Rheumatic	Yes, sinoauricular tachycardia	+	+	0	0	0	+	0	+	0
11 J. M.	♂ 49	140/90	Arteriosclerotic, recent infarct	None	0	+	++	0	0	0	0	+	0

* More than one episode of arrhythmia.

slightly greater than that caused by the insertion of the needle was experienced; this continued for a few seconds only. There was no other local reaction, either immediate or delayed, and no induration at the site of injection.

One patient vomited one hour and forty minutes after the third injection of soluble quinidine when the rhythm became normal. This patient had a similar experience on one previous occasion when the rhythm was converted to normal by quinidine orally. One patient

with Injectable Quinidine

Duration of Arrhythmia Before Intramuscular Therapy		Treatment and Response of Apical Heart Rate							Total Dose and Time	Duration of Arrhythmia After Last Dose
2 hours	Time	9:30 a.m.	11:00	11:05	12:00 n.	.....	.....	.....	1 hour 45 minutes	1 hour
	Dose	1.05 Gm.		1.50 Gm.					2.55 Gm.	
	Rate	200	100		120					
3 hours	Time	11:00 a.m.	1:00 p.m.	3:30	4:20	6:00	.....	.....	5 hours 20 minutes	1 hour 40 minutes
	Dose	0.6 Gm.	0.86 Gm.		1.0 Gm.				2.46 Gm.	
	Rate	158		134		76				
1 hour 15 min.	Time	9:45 a.m.	10:45	11:20	11:45	12:45 p.m.	.....	.....	2 hours	1 hour
	Dose	0.6 Gm.	0.6 Gm.		0.6 Gm.				1.8 Gm.	
	Rate	160-180		180		100				
1 hour 40 min.	Time	11:40 a.m.	12:45 p.m.	1:20	2:55	.....	.....	.....	1 hour 30 minutes	1 hour 35 minutes
	Dose	0.6 Gm.	0.6 Gm.	0.6 Gm.					1.8 Gm.	
	Rate	144	144		80					
3 hours	Time	10:00 a.m.	10:35	12:10 p.m.	1:40	.....	.....	.....	2 hours 10 minutes	1 hour 30 minutes
	Dose	0.4 Gm.	0.8 Gm.	0.6 Gm.					1.8 Gm.	
	Rate	196			65					
1 hour ±	Time	12:45 p.m.	Died at 1:45 p.m.	.....						
	Dose	0.45 Gm.							0.45 Gm.	
	Rate	140								
2 hours 5 min.	Time	6:05 p.m.	7:00	9:00	.....	.....	.....	.....	55 minutes	2 hours
	Dose	0.15 Gm.	0.3 Gm.						0.45 Gm.	
	Rate	182		130						
1 hour 45 min.	Time	9:45 a.m.	11:15	.....	.....	.....	.....	.....	.....	1 hour 30 minutes
	Dose	0.45 Gm.							0.45 Gm.	
	Rate	160	120							
1 hour ±	Time	8:15 a.m.	9:45	.....	.....	.....	.....	.....	.....	1 hour 30 minutes
	Dose	0.45 Gm.							0.45 Gm.	
	Rate	180	110							
5 hours 30 min. ±	Time	1:30 p.m.	2:00	.....	.....	.....	.....	.....	.....	30 minutes
	Dose	0.33 Gm.							0.33 Gm.	
	Rate	100	80							
3 weeks	Time	9:40 a.m.	10:15	11:15	.....	.....	.....	.....	35 minutes	1 hour
	Dose	0.3 Gm.	0.45 Gm.						0.75 Gm.	
	Rate	160		80						
4 hours ±	Time	1:25 p.m.	6:05	10:20	10:00 a.m.	.....	.....	.....	9 hours	12 hours
	Dose	0.75 Gm.	0.9 Gm.	1.05 Gm.					2.7 Gm.	
	Rate	184		130	Normal rhythm					
1 hour	Time	5:30 p.m.	7:20	9:30	9:55	11:00	1:00 a.m.	7:00	4 hours 25 minutes	Less than 9 hours
	Dose	0.3 Gm.	0.6 Gm.		0.75 Gm.				1.65 Gm.	
	Rate	220		150		112	120	80		
1 hour ±	Time	10:15 a.m.	11:20	.....	.....	.....	.....	.....	.....	1 hour
	Dose	0.6 Gm.							0.6 Gm.	
	Rate	190	120							
2 hours	Time	8:20 p.m.	8:45	9:00	9:30	9:50	10:30	.....	1 hour 30 minutes	1 hour
	Rose	0.6 Gm.				0.6 Gm.			1.2 Gm.	
	Rate	200	168	124	96	100	Normal rhythm			
6 hours ±	Time	3:40 p.m.	4:00	4:30	5:00	5:30	6:00	.....	.....	2 hours 20 minutes
	Dose	0.6 Gm.							0.6 Gm.	
	Rate	118	110	118	116	118	80			
3 hours	Time	2:30 a.m.	3:30	4:00	4:30	5:00 normal rhythm		.....	.....	2 hours 30 minutes
	Dose	0.6 Gm.							0.6 Gm.	
	Rate	120	108	84	96	116				
.....	Time	1:00 p.m.	3:00	5:30	8:10	10:30	1:10 a.m.	.....	12 hours	
	Dose	0.6 Gm.	0.8 Gm.	1.0 Gm.	1.2 Gm.	1.0 Gm.	1.0 Gm.		5.6 Gm.	
	Rate	130	130	104	118	108	112			
1 hour	Time	9:30 p.m.	11:35	1:45 a.m.	2:10	4:30	6.00	.....	4 hours 40 minutes	Less than 3 hours
	Dose	0.3 Gm.	0.5 Gm.		0.45 Gm.				1.25 Gm.	50 minutes
	Rate	215		200			80			
3 hours 30 min. ±	Time	9:30 a.m.	10:00	11:00	11:45	12:30 p.m.	1:15	.....	3 hours	45 minutes
	Dose	0.3 Gm.	0.3 Gm.	0.6 Gm.		1.0 Gm.	Normal rhythm		2.2 Gm.	
	Rate	180			150					
8 hours ±	Time	8:30 p.m.	10:10	12:15 a.m.	3:55	9:00	.....	.....	7 hours	Less than 5 hours
	Dose	0.45 Gm.	0.75 Gm.	1.0 Gm.	1.2 Gm.				3.4 Gm.	
	Rate	200	120	106	112	Normal rhythm				
3 days	Time	11:35 a.m.	.....	2:00 p.m.	.....	.....	.....	.....	1 hour 30 minutes	
	Dose	0.3 Gm.		0.6 Gm.					0.9 Gm.	
	Rate	160								
3 months	Time	2:00 p.m.	.....	4:15	.....	.....	.....	.....	2 hours 15 minutes	
	Dose	0.6 Gm.	0.3 Gm.	0.9 Gm.					1.8 Gm.	
	Rate	120-180								
1 hour 15 min.	Time	10:05 p.m.				.....	.....	.....	0.75 Gm.	
	Dose	0.75 Gm.	.....	.....	.....					
	Rate	144								

(case 20) had diarrhea after receiving 3.6 Gm. within seven hours. There were no instances of tinnitus, dermatitis or other toxic manifestations following medication.

Mortality.—Six patients died during their hospital stay. In no instances could death be attributed to the quinidine therapy. All of these patients were moribund when therapy was started. Four died twenty minutes to four days after conversion of the rhythm to normal (cases 14, 16, 7 and 10); 2 died without control of the arrhythmia (cases 9 and 20).

The prognosis for life when therapy was started was very poor in 14 instances, doubtful in 5 and favorable in 5. In 4, therapy appeared to be a life saving measure (cases 1, 15, 3 and 16). In 11 other instances therapy had a favorable influence on the symptoms and course of the disease.

Comparison of Intramuscular with Oral and Intravenous Administration.—Four patients were vomiting at the time therapy was started, and it was obviously impossible to give medication by mouth.

Two patients previously had been treated for similar episodes by oral quinidine or intravenous quinine. In 1 patient (case 1) ventricular tachycardia was converted to normal rhythm twenty minutes after the fifth dose of quinidine sulfate by mouth (0.3, 0.5, 0.6, 0.6 and 0.6 Gm.); a total of 2.63 Gm. had been given within eight hours. Twelve days later a recurrence of ventricular tachycardia was converted to normal rhythm one hour and forty minutes after the third intramuscular injection. Quinidine was injected at intervals of two to three hours (0.6, 0.86 and 1 Gm.); a total of 2.46 Gm. was given within five hours and twenty minutes.

Patient 12 had numerous paroxysms of auricular fibrillation. On two occasions these were treated successfully with quinidine sulfate by mouth (0.3 Gm. every two hours for five doses), but each time the patient had a severe diarrhea and was unable to continue with a maintenance dose of quinidine. On two other occasions quinine dihydrochloride was given intravenously (1.2 Gm. given in the course of four hours and 3.1 Gm. over a period of sixteen hours). In both instances the rhythm was controlled, but tinnitus and other severe toxic reactions to the drug developed.

Intramuscular therapy was used on two occasions. In 1 instance 0.73 Gm. was given in two doses thirty-five minutes apart. The rhythm reverted to normal one hour after the second dose. On the second occasion 2.7 Gm. was given in three divided doses at intervals of four hours. The rhythm became normal within twelve hours after the last dose. On neither occasion did the patient experience any gastrointestinal or other symptoms.

Two patients received injectable quinidine on more than one occasion. On one occasion (case 8) auricular fibrillation reverted to normal rhythm two hours after a total of 0.45 Gm. had been administered intramuscularly in two divided doses, and on two other occasions the rhythm reverted one hour after a single intramuscular dose of 0.45 Gm. The rhythm of a second patient (case 12) reverted one hour after a total of 0.75 Gm. was given intramuscularly in two divided doses thirty-five minutes apart, while on the second occasion it failed to revert after a total of 2.7 Gm. in three divided doses given at intervals of four hours.

A third patient (case 7 and 7 *a*) was treated successfully on one occasion for paroxysmal auricular fibrillation and at another time for paroxysmal ventricular tachycardia. A total of 1.65 Gm. was given for the first arrhythmia in three divided doses over a period of four hours and twenty-five minutes, while in the latter instance a total of 2.5 Gm. was given in two divided doses one hour and forty-five minutes apart.

It is evident that intramuscular quinidine is at least as effective as oral or intravenous preparations and is less likely to cause toxic symptoms. Intramuscular administration is of obvious value when the patient is vomiting or is in collapse and oral therapy is unsatisfactory. Undoubtedly other more soluble preparations of quinidine will be made available in the future. One such preparation, quinidine hydrochloride dissolved in propylene glycol, has been suggested by Dr. Mark Altschule and Mr. Harry Brass and is being investigated at the present time. The preparation of quinidine hydrochloride with urea and antipyrine used in these studies has the advantage of being available at the present moment and of proved value without untoward side reactions.

SUMMARY AND CONCLUSIONS

1. A soluble preparation of quinidine suitable for parenteral administration containing 0.15 Gm. in each cubic centimeter can be made by the addition of urea and antipyrine to quinidine hydrochloride. The preparation of this solution is not difficult and the ingredients are readily available. Since this injectable quinidine can be stored in ampules, it is of practical value in the emergency treatment of acute cardiac arrhythmias.

2. Twenty-four episodes of acute cardiac arrhythmias in a series of 20 patients were treated by the intramuscular administration of this preparation. In 15 instances (13 patients) the rhythm was converted to normal. In 3 additional instances conversion to normal was probably due to this therapy. In 1 instance the dose used was too small. In the remaining 5 instances the drug failed to control the abnormal rhythm. Three of the 5 instances were attacks of sinoauricular tachycardia.

3. Toxic reaction to the drug (mild diarrhea) was experienced by only 1 patient. No local reactions were encountered.

4. The following appears to be a practical method for using the drug in the treatment of acute arrhythmias:

An initial dose of 0.45 to 0.6 Gm. should be given intramuscularly.

The response to each dose should be observed for one and one-half to two and one-half hours. If conversion to normal rhythm does not occur in that time, additional medication is indicated.

A favorable response consists in definite slowing of the apical heart rate, a rise in blood pressure to above the shock level, decrease in symptoms or striking improvement in the patient's general condition. In such instances the initial dose may be repeated. If a favorable response is not observed, it is advisable to increase the size of the dose.

5. Injectable quinidine can be used whenever oral quinidine therapy is advisable. It is especially indicated when absorption from the gastrointestinal tract may be delayed or unreliable (vomiting, shock, and the like) and when rapid therapeutic action is desired.

330 Brookline Avenue.

COUNTY ACCREDITATION PLAN FOR TUBERCULOSIS CONTROL

J. ARTHUR MYERS, M.D.
MINNEAPOLIS

For a number of years the members of the Committee on Tuberculosis of the Minnesota State Medical Association have felt that tuberculosis has been reduced to such a degree in this state and the physician's armamentarium is now such that the time is ripe for an all out campaign against this disease.

In 1940 a questionnaire was sent to each of the state medical associations to determine what was being done in other states. We were somewhat surprised to learn that thirteen of the state medical associations did not have a tuberculosis committee; in fifteen states such committees have been in existence for three years or less, and in four states for three to five years; in the remainder the committees had been in existence for more than five years. In three states the tuberculosis work was done by a subcommittee of a public health committee. In most of the states the activities of the tuberculosis committees were of a general nature, and in less than six states was there an adequate program. However, in Hawaii and Alaska good programs were under way; but the best was found in Puerto Rico. Thus it appears that our state medical associations, as such, have done little by way of organization or control tuberculosis. Our committee [1] is of the opinion that state medical associations everywhere should play a leading role in tuberculosis control.

Our members surveyed the field with reference to the various methods of approach. We were cognizant of the fact that there are enthusiastic advocates for the examination of certain groups in a given community. For example, there are those who maintain that the examination of children is adequate, but there is abundant evidence to show that children prior to 12 years rarely have contagious pulmonary tuberculosis; therefore, from the standpoint of actually finding cases of this type of the disease, not enough exist to justify the effort and expense. The administration of the tuberculin test to children of all ages has been found of great value for two reasons: First, whenever a child reacts characteristically to tuberculin there can be no doubt that he has had direct or indirect contact with a case of contagious tuberculosis, and a search for such cases among the reacting children's adult associates is always profitable if it is carefully done, despite the fact that not all sources are found in this manner. Second, every child who reacts to tuberculin should have routine, annual examinations when adulthood is reached.

In the high school age group the same facts obtain as in the grade school period, except that the reinfection type of chronic pulmonary tuberculosis becomes more prevalent, and therefore all high school students who react to tuberculin should have annual examinations for clinical pulmonary tuberculosis.

While the examination of preschool, grade and high school children as outlined is of great value, it is obvious that this alone is inadequate, since there is often contagious tuberculosis in homes where there are no children.

Another method that has been emphasized consists in the examination of the contacts of patients with contagious tuberculosis. By this method one procures from the health department the names and addresses of all persons reported as having clinical tuberculosis, and to this list are added the names of all persons whose death certificates state that they have died from tuberculosis during the past five or ten years. An attempt is then made to examine the contacts of the current patients as well as of those who have died from the disease. This our committee recognized as a good case finding method, but it was thoroughly cognizant of the fact that one could never hope to control the disease completely in a community by this method alone, because there are many persons who die from chronic pulmonary tuberculosis whose disease is first reported to the health department by death certificate. In some of our states this is true in as many as one fourth to one half of the cases. Thus, many persons with contagious tuberculosis are permitted to do all the harm that is possible, by way of dissemination of tubercle bacilli, without our knowledge of the existence of their disease. Obviously, therefore, the examination of so-called contacts only is not adequate. Moreover, there is a significant number of persons who have contagious tuberculosis and die from other major conditions and the tuberculosis is never recognized. Thus death certificates by no means reveal all those persons who have contagious tuberculosis at the time of death. Thus the persons exposed to such individuals cannot be included by the method of examining contacts only.

Other special groups, such as the personnel of school systems and hospitals, industrial workers, relief clients, pregnant women and elderly persons, may be examined with great advantage. As laudable as is such an undertaking in any community, it would not suffice to control tuberculosis adequately, since many contagious cases may exist among the groups not examined.

Our committee found that many physicians have been misled by the method that has heretofore been used in determining the cost of finding cases of tuberculosis. For example, if a thousand university students were examined and only 0.5 per cent, that is, 5 individuals, were found with demonstrable reinfection type of pulmonary lesions, the entire cost of the thousand examinations was charged to these 5 cases. To us this does not seem to be the proper conception of the cost of case finding, since if 20 per cent, or 200, of the thousand students react to tuberculin, one has, in the strict sense of the word, found 200 cases of tuberculosis. Moreover, the cost of examining the entire thousand should not be charged only to the 200 cases, for it is of great value to know that the remaining 800 do not have tuberculosis in any stage of its development.

Every physician knows that tuberculosis is contagious and obviously, all contacts of contagious cases should be examined not only once but periodically as long as no clinical disease is found. This would be an ideal method if all contagious cases were known. Our committee members came to the conclusion that the only way to find all cases of tuberculosis is to examine every

Read before the joint session of the Mississippi Valley Conference on Tuberculosis and the Mississippi Valley Trudeau Society in Chicago, Sept. 17, 1942.

1. Other members of the committee are Drs. R. N. Barr, L. V. Berghs, H. A. Burns, S. S. Cohen, K. A. Danielson, C. F. Ewing, W. H. Feldman, L. H. Flancher, E. K. Geer, G. A. Hedberg, A. J. Henderson, R. R. Hendrickson, W. S. Hitchings, E. A. Meyerding, K. H. Pfuetze, C. L. Scofield, S. A. Slater and B. B. Souster.

one in the entire community or political division, for often this disease is found where it is least expected. Every community should determine its entire tuberculosis situation; it does not suffice to know only about those who have entered on the consumptive stage in the development of the disease. It is important to know how many and who are entirely free from tubercle bacilli, how many and who have these organisms in their bodies and those in the latter group who have or later develop demonstrable clinical disease that requires treatment.

Our committee members were cognizant of the fact that to undertake a complete campaign against tuberculosis in an entire state as an initial program was too great a step for one time. While this was recommended to all the medical societies in the state as a procedure to take under advisement, it was decided that a county should be selected where there was every reason to hope that an all out campaign would not only be instituted but would be completed by the local physicians and their allies. This county would become the demonstration center in which the various details of the campaign could be tested and which would later serve as a laboratory for the physicians of the other counties. Numerous counties were considered, and Meeker was chosen for several reasons, some of which are as follows:

1. The first mass tuberculin testing of human beings done in Minnesota was carried on in Meeker County in 1912 by the late Dr. H. G. Lampson of the Minnesota State Board of Health. 2. This county was the first in Minnesota to institute a county wide tuberculin testing campaign of its cattle. This program, which was begun in 1923, met with much opposition; in fact, it was carried to the Minnesota courts two or three times and finally to the United States Supreme Court. However, those in charge of the campaign were successful and the county was accredited in 1925. The other counties profited by this example and in 1935 all the counties were accredited and, thus, the entire state became an accredited area. 3. Meeker County still has a relatively high tuberculosis mortality rate and, thus, there existed an opportunity to demonstrate what can be done in controlling the disease in man. 4. The medical profession in this county is composed, without exception, of physicians with a modern point of view and a strong desire to control the disease in man at the earliest possible time.

The next step was to determine whether the local medical profesion of Meeker County would be willing to undertake such a program. On Aug. 19, 1940 members of our committee met with the physicians in Meeker County. They were found to be unanimous in their desire to make their county the laboratory center for the state. Their chief interest was to control the disease as soon as possible. For several months thereafter the state committee met with the Meeker County Society, and after much discussion and careful consideration of various methods of procedure it was decided that the program should consist of the following procedures:

1. The tuberculin test should be offered to the entire population of 19,000 citizens.

2. X-ray film inspections of the chests should be made of all persons who reacted to tuberculin.

3. Careful clinical and laboratory examinations should be made of those whose x-ray films revealed shadows that might be caused by clinical pulmonary tuberculosis.

4. Arrangements should be made for adequate treatment and isolation, when necessary, of all persons found to have this type of tuberculosis.

It was decided that the intracutaneous (Mantoux) method of administering tuberculin is superior to all others and that Koch's old tuberculin should be employed since it could be supplied gratis, in the proper dilution to the physicians of the county, by the state department of health. Moreover, the local physicians agreed to administer and interpret the tuberculin test to every citizen of the county without any financial remuneration.

All the various methods of making x-ray film inspections of the chest were carefully considered by the local physicians and the members of the state committee. It was decided to use paper film of standard size in cut sheets because there was an abundance of evidence available to show that this film is equal to celluloid film in the detection of pulmonary lesions. Moreover, this film could be procured at a good deal less than one-half the cost of celluloid film. While the paper film is considerably more expensive than the miniature films (35 mm. and 4 by 5 inch) used in making photofluorograms, these miniature films were not considered equal to the paper film of standard size. Moreover, no outlay for new x-ray equipment was necessary for exposure and development of the paper film.

X-ray equipment was found to be available in the offices of four physicians and one hospital, and it was agreed that all x-ray work would be done with these five machines. The local physicians were most generous in volunteering to expose and develop the films with no financial consideration, but it was understood that the state committee would attempt to procure funds for the purchase of the unexposed films. The members of the committee were desirous that all work be done by the local physicians, several of whom were proficient in describing shadows seen on x-ray films. Therefore all films would be described by local physicians who were thoroughly cognizant of the fact that final diagnosis from x-ray shadows alone is a physical impossibility. In other words, the physicians of Meeker County looked on the x-ray film inspection only as a screen to determine those who have lesions in their lungs sufficiently large to cast shadows that can be seen with the naked eye and which might be due to tuberculosis. The two screens used to select persons who need examinations, namely the tuberculin test and the x-ray film, are simple and easily conducted phases of the examination, but the determination of etiology of the lesions which cast shadows is often attended with considerable difficulty. However, the physicians of Meeker County are fully capable of solving the most difficult diagnostic problems in their own offices and hospital.

This program actually began on May 1, 1941 and has proceeded in a most satisfactory manner. The physicians have worked diligently, and their enthusiasm has not waned. On May 1, 1942 5,412 persons had been tested with tuberculin, of whom 22 per cent reacted. Other phases of the examination of the reactors had led to the diagnosis of clinical pulmonary tuberculosis in 10 persons previously unsuspected of

having this disease. The contagious patients have already been taken out of their homes and isolated in institutions.

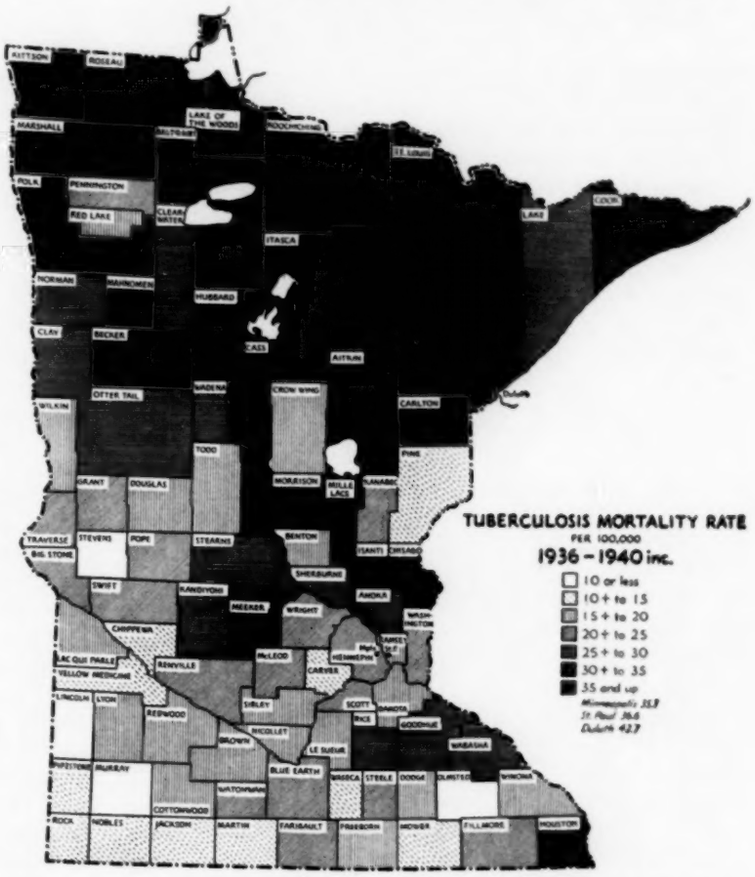
When the work is done by the local physicians and their allies, it is slower than it would be to import a large group of workers and special equipment. On the other hand, work done by the local group is far more satisfactory. The public comes to know that its local medical profession is capable of solving this problem. Moreover, the program will be perpetuated when the demonstration period is over. Thus, in Meeker County an all out campaign against tuberculosis is under way with the idea of sweeping clean, so that for the moment no patients with contagious tuberculosis will be permitted to spread the disease. It is the intention of the local physicians to retest the nonreactors to tuberculin periodically and to reexamine as often as possible those who have become reactors, as well as those found to be reactors on the first test, in order that those who subsequently develop clinical tuberculosis may have their disease detected before it becomes contagious or even causes illness.

With the Meeker County demonstration well under way, the tuberculosis committee of the state medical association turned more of its attention to the remaining eighty-six Minnesota counties. The state department of health kindly provided the average mortality rate in each county for the previous five years. From this a map was prepared from which one could readily visualize the tuberculosis situation with reference to the mortality rate in each county. Immediately we saw that there exists a wide range in mortality; in fact, from 5.5 in one county to 68.2 per hundred thousand in another. The tuberculosis mortality rate for the entire state of Minnesota in 1941 was 26.6 and for the entire nation it was 44 per hundred thousand.

The members of the Tuberculosis Committee decided that some recognition should be given counties where a great deal of tuberculosis work had been done, with a satisfactory result, for two main reasons: (1) to call attention to the fine accomplishments in these counties and (2) to stimulate the physicians and their allies in other counties to intensify their tuberculosis control program. This idea was borrowed from the United States Bureau of Animal Industry, the United States Livestock Sanitary Board, the American Veterinary Medical Association, and state veterinary organizations which had cooperated and had so effectively controlled tuberculosis in cattle. As early as 1922 they had prepared county outline maps of the entire nation, showing the incidence of tuberculosis in cattle in the various counties of each state. This original map gave a basis for planning future work, since it high lighted the areas of disease concentration. This map was revised as the work progressed. Widely distributed, the map impressed the public as well as the veterinarians, for it focused attention on the situation throughout the nation. The veterinarians and their allies considered this one of the most valuable parts of their educational program.

The United States Bureau of Animal Industry developed a standard by which counties could receive the designation of modified areas. Any county could qualify for this designation when careful testing of its cattle revealed that not more than 0.5 per cent reacted to tuberculin. The first list of counties to qualify under the modified accredited plan was reported on July 23, 1923. Indeed, on that date there were just seventeen such counties in the entire nation and they were limited to only four states.

This was the beginning of the most spectacular and practical control of tuberculosis in recorded history. It stimulated great interest everywhere, and such factors as local pride became important in the control of tuberculosis among animals. By Oct. 1, 1928 all the counties of North Carolina had been accredited and on that date this was the first state in the nation to be designated as a modified accredited area. On May 1, 1929 the state of Maine received this designation. The veterinarians' program gained momentum, and on Nov. 8, 1940 the last county in the United States became a modified accredited area and, thus, the entire nation, together with its territorial possessions, was so designated. This, the greatest of all tuberculosis accomplishments in the recorded history of the world, was made possible only by the tuberculin test. All other procedures combined, such as symptoms, physical signs, x-ray shadows and microscopic examinations of secretions and excretions, were not enough; it was only when the veterinarians had a delicate, highly specific



Tuberculosis mortality rate in Minnesota per hundred thousand, 1936-1940 inclusive.

and accurate biologic test to screen out all animals that had living tubercle bacilli in their bodies that such an accomplishment became possible.

Our committee considered standards by which counties might qualify for accreditation with reference to tuberculosis in man. The first standard to be determined was a tuberculosis mortality rate of ten or less per hundred thousand. By this standard four counties qualified. The committee members were aware of the fact that many persons who have contagious tuberculosis die of other conditions without the tuberculosis being reported on the death certificate. The mortality rate is not the best criterion of the tuberculosis situation in a county. They are of the opinion that the incidence of the first infection type of tuberculosis, as manifested by the tuberculin reaction, is the only good available index. Therefore it was decided to adopt a second standard based on the incidence of tuberculin reactors at a given age level. It was decided that, if at least 80 per cent of all the senior students of the high schools of a county were tested and not more than 15 per cent reacted, a county might qualify for accreditation provided the average mortality rate for the past five years did not exceed 10 per hundred thousand. The medical societies of the four counties which qualified from the standpoint of the mortality rate were informed concerning the tuberculin reactor standard. Within two weeks of the date of receipt of this information, the physicians of Lincoln County, which had the lowest mortality rate, had tested practically all of the senior students in their high schools and reported that only 7.4 per cent reacted. Thus the first county in the state had qualified for accreditation.

It was then necessary to determine who should be responsible for the accreditation. The plan was submitted to the council of the state medical association, by which it was unanimously approved. It was then presented to the members of the Minnesota Department of Health with the same action. Governor Stassen was consulted, and he agreed whole heartedly that the plan was good and expressed his willingness to sign the certificate of accreditation. A certificate form was prepared showing that the accreditation was granted by the state medical association, the state department of health, signed by the president of the state association, the executive secretary of the department of health and Governor Stassen. On Dec. 11, 1941 the accreditation ceremonies were held in Tyler, when the main address was given by Dr. W. H. Feldman of the Mayo Clinic, and the certificate was presented to Lincoln County by Dr. B. J. Branton, president of the state medical association.

The physicians of Olmsted County promptly tested the senior students in their high schools and found that only 8 per cent reacted. This, together with an average mortality rate over the past five years of 8.7, qualified this county and the accreditation ceremonies were held in Rochester, Minn., on May 22, 1942, when Dr. C. A. Stewart, director of the department of pediatrics of the Louisiana State University, presented the main address. This meeting was attended by many prominent persons, and Dr. H. Z. Giffin of the Mayo Clinic and president of the Minnesota State Medical Association presented the certificate to Olmsted County.

In Murray County, where the average tuberculosis mortality rate for the past five years was 9.4 per hundred thousand the physicians tested the senior students in the high schools and found that only 5.5 per cent reacted. Accreditation ceremonies were held at Slayton, Minn., Aug. 28, 1942, when Governor Stassen presented a splendid address and Senator Webber participated in the program. Dr. Stephen H. Baxter, president-elect of the Minnesota State Medical Association, presented the certificate to Murray County.

In Stevens County, where the average mortality rate for the past five years was 9.2 per hundred thousand, the medical society found that only 7 per cent of the senior high school students reacted to tuberculin. The accreditation ceremonies are now being arranged.

It is often stated that the majority of senior high school students will not submit to the tuberculin test. Our experience to date has proved this statement to be erroneous; in fact, we have found the high school students eager to have the test administered. In no county to date has less than 90 per cent of these students accepted the test, and most of the remainder did not have it for such reasons as absence from school when the test was being administered. We believe that this success is due largely to informing the students and the community adequately concerning the value and practical significance of the test.

In most parts of the country the age at which persons die from tuberculosis is rapidly increasing and in some places it is well beyond middle life. Probably many of these older persons who die from tuberculosis have had the disease in chronic form for a long time; in fact, before the present campaign against the disease was really in effect. Therefore we should not allow mortality to discredit the fine work that has been done in recent years to protect children and young adults against tuberculosis and which seems to have been so successful, from the standpoint both of morbidity and of mortality, in the second and third decades of life.

In several sanatoriums and in a good many homes in Minnesota there are old persons with chronic tuberculosis who will die in the next few years, and their deaths will tend to keep the mortality rate high in some of our counties. Therefore it seems more fair to the tuberculosis workers of the state and at the same time it would reflect the excellent work done in the past decade or so if we discontinued the mortality standard and used tuberculous infection standards entirely.

The committee is considering a standard based on incidence of infection of children in the first grade, and another on incidence of infection among high school students. We believe that this will be more encouraging to our tuberculosis workers and will stimulate greater interest among them and among the public at large. With such accreditation standards every community should have a reason for striving to see that children are protected from contact with contagious persons, including those beyond middle life, and will attempt to seek out these persons and insist that they be institutionalized.

Those persons in Minnesota who are in the best position to know about the tuberculosis situation have informed us that the accreditation of counties, with reference to tuberculosis in man, has done more to stimulate interest and action than any other movement in the entire tuberculosis history of the state.

EPIDEMIC PLEURODYNIA IN BROOKLYN IN THE SUMMER OF 1942

TASKER HOWARD, M.D.
CHARLES A. WEYMULLER, M.D.
JOHN EDSON, M.D.
ELIZABETH ITTNER, M.D.
JANET WATSON, M.D.
AND
MARY L. CASSIDY, M.D.
BROOKLYN

In 1872 Daae [1] in Norway described an epidemic characterized by the sudden occurrence of violent pain in the lower part of the thorax without concomitant signs in the chest. The pain tended to spread to the abdomen on the same side and sometimes involved the back and limbs. With this there was fever. The attack lasted but a day or so, with a tendency to recurrence once or twice within a few days. Daae spoke of the disease as epidemic muscular rheumatism. Two years later Finsen reported having observed epidemics of this character in Iceland in 1856 and 1863 and was the first to speak of this disease as epidemic pleurodynia. But little further was heard of the disease in Europe until 1930, when Sylvest's paper about a similar epidemic in Bornholm aroused so much interest that the disease was made reportable in Denmark, and 10,000 cases were reported in the next two years. Since then many epidemics have been described in Scandinavia and in the British Isles. Meanwhile, in the United States the disease was repeatedly reported, beginning with Dabney's [2] account of an epidemic in Virginia. It was one of Dabney's patients who dubbed the disease "the Devil's grip."

In 1935 Harder [3] tabulated the American reports of epidemics which he considered to be this disease. These included the reports of Dabney (Virginia) 1888, Reilly (New York) 1899 and 1921, Payne and Armstrong (Virginia) 1923, Hangar, McCoy and Frantz (New York) 1923, Greene (New York) 1923, Torrey (Pennsylvania) 1924, Churchill, Landis and Glusker (Massachusetts) 1926, Richter and Levine (Massachusetts) 1933, Crone and Chapman (Massachusetts) 1933, Callaway (North Carolina) 1934 and Harder (Ohio) 1935.

Reports of other epidemics include Kirkwood and Stoll [4] (Illinois) 1934, Locke and Farnsworth [5] (Massachusetts) 1935, Hawkins and Harms [6] (Missouri) 1936 and Fulghum [7] (Georgia) 1940.

From the various accounts of these epidemics it is apparent that the diagnosis rests on the epidemic occurrence of the disease; that it affects children and young adults; that it occurs, in this country at least, only in the summer months, and that its clinical manifestations are fairly distinctive. The laboratory is of no positive help.

Perhaps the first description of the disease is still the best. In 1872 Daae [1] wrote:

> As a rule the patient has a stitch in one side of the chest, most often without any precursory ailment, but sometimes after an attack of chills; the stitch is often accompanied by pains in the back, shoulders, epigastrium and abdomen, and these pains are described sometimes as oppressive or sticking, sometimes as shooting or aching; less frequently these pains are felt also in the back, neck, legs, arms and even out in the fingers. There is considerable difficulty in moving the affected parts, especially the chest; therefore, the respiration is laborious, sometimes to such an extent that the patient feels as if he were to be strangled. Usually the general condition is greatly affected. There is as a rule some headache, anorexia and thirst; the bowels usually are sluggish. The tongue is generally coated. The pulse is normal or a little frequent. There is seldom any cough, so cough does not appear to go with this disease. Physical examination of the chest reveals no abnormality.
>
> There is a great difference in the severity of the attack in the various patients. Some have a fairly mild attack and have to rest only a very short time; in others the attack is so violent that one might expect them to die at any minute. In a few of the most severe cases the patients are thus confined to bed continuously for up to fourteen days.
>
> As a rule the patients have got up and walked about just as soon as they have been able to do it. A good many of them have then had a relapse, sometimes repeatedly. No case has terminated fatally. Many of the patients are exhausted after the disease, emaciated and feeble; sometimes they feel a stitch or stabbing pain now and then for several weeks after they have been able to begin to work.

Cases of this disease began to appear in the Red Hook section of Brooklyn in July 1942. To date at the Long Island College Hospital we have observed 166 cases. Of these, 40 were admitted to the hospital. This epidemic tends to differ in some respects from others that have been reported. There is a much higher percentage of cases showing involvement of the central nervous system, frank encephalitis having been encountered a number of times, and many of the infants had convulsions. Encephalitis was noted once in one epidemic in Sweden [8] and was mentioned by Sylvest as having been reported by "a Danish physician" in another epidemic. MacDonald and his associates [9] noted that an epidemic of benign lymphocytic meningitis was occurring concomitantly with the epidemic myalgia in Cincinnati in 1935. These authors speculated on the relationship between these two groups of cases.

Many authors have commented on the absence of infection of the upper respiratory tract in these patients, but all of the infants in our series and about three fourths of the older patients showed some congestion of the pharynx. This is not altogether exceptional, however, since more than half of the cases reported by Attlee and his associates [10] in England in 1924 and all of Fulghum's [7] in the 1940 Georgia epidemic were said to present pharyngitis.

We have noticed some differences in the manifestations of this disease in adults and children in this epidemic. It seems wise to consider the two groups separately.[11]

From the Departments of Medicine and Pediatrics of the Long Island College of Medicine and the Long Island College Hospital.

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11. Specimens of nasal washings, stools, spinal fluid and blood from many of these patients have been submitted to Dr. Karl Habel and Dr. Michael L. Furcolow of the National Health Institute, Bethesda, Md., for investigation as to the etiologic factor of this disease.

ADULT CASES

Abstracts of a few cases will illustrate the typical course in adults:

CASE 1.—D. McL., a girl aged 13, admitted July 1, 1942, suddenly had chilliness, fever and pain in the right upper quadrant four days before. The pain would follow coughing, laughing or raising the right shoulder. She had daily short recurrences of pain and fever. On the night of admission the pain was much more intense.

The temperature was 101.6 F., the pulse rate 100 and the respiratory rate 20. The pharynx was clear. There were a slight respiratory lag and moderate costovertebral tenderness on the right side and slight spasm and tenderness in the right upper quadrant. Roentgen examination was thought to show a slight congestion in the right lung.

Laboratory examination revealed 5,200 white blood cells with 81 per cent polymorphonuclear leukocytes.

The temperature became normal and pain was relieved in sixteen hours. There was no further recurrence. Convalescence was rapid.

CASE 2.—J. O., a woman aged 22, admitted Aug. 3, 1942, three days before admission began to suffer from pain in the right side of the lower part of the chest on respiration and to a lesser degree on the left side. She had chills and fever and aching of her back and legs. Her throat was dry and she was weak and dizzy.

The temperature was 99.8 F., the pulse rate 82, the respiratory rate 15 and the blood pressure 102 systolic and 60 diastolic. She was profoundly prostrated and apathetic. Her pharynx and tonsils were moderately inflamed. Neurologic examination was negative.

Laboratory examination revealed 7,800 white blood cells with 71 per cent polymorphonuclear leukocytes; the urine was normal. Culture of material from the throat showed gamma streptococci predominating and a few beta streptococci.

The next day she felt entirely well and was discharged after three days. Four days later she was readmitted to the hospital stating that for two days she had suffered from headache, weakness, irritability, general aching pains, vertigo and sensitivity to noise. She had fainted immediately before admission.

The temperature was 101.1 F., pulse rate 88, respiratory rate 22 and blood pressure 102 systolic and 64 diastolic. She was lethargic, apathetic and acutely ill. There was photophobia. Her pharynx was slightly injected. There was pain in the occiput on extreme flexion of the neck. Abdominal reflexes were absent. The Babinski reflex was elicited on both sides.

Laboratory examination revealed 5,950 white blood cells with 54 per cent polymorphonuclear leukocytes. The sedimentation rate was 65 mm. in one hour. The urine was normal. The spinal fluid, August 10 (tenth day of the disease), showed pressure of 240 mm. of water, 261 cells with 97 per cent lymphocytes; a test for globulin was negative; the protein was 40 mg., sugar 62 mg. and chlorides 679 mg. per hundred cubic centimeters. August 15, spinal fluid showed a pressure of 60 mm. of water and 41 cells, all lymphocytes; a test of the globulin was negative. August 26 it showed a pressure of 70 mm. of water and 7 cells, all lymphocytes.

Her temperature was normal except for one slight rise on the fifth day. After two days she was normally alert and her photophobia and general discomfort had disappeared. Her convalescence was normal except for a recurrence of headache when she tried to sit up.

TABLE 1.—*Epidemic Pleurodynia—Adult Cases*

Name, Age	Pain	Fever	Headache	Nausea and Vomiting	Tenderness	Pharyngitis	Blood Count: White Blood Cells	Blood Count: Polymorphonuclears, %	Spinal Fluid Cells	Sedimentation Rate, Mm.	Duration, Days	Paroxysms	Complications
D. McL. 13	Right upper quadrant, moderate	101.6	0	0	Right upper quadrant, moderate, costovertebral	0	5,200	81	—	—	5	4	
C. B. 13	0	101	+	+	0	0	11,400	83	72	14	2	1	Encephalitis
N. P. 14	Epigastric, moderate	102	+	+	Right lower quadrant, moderate	+	12,500	81	—	—	7	1	Appendectomy
T. S. 14	Right upper quadrant, severe	103.2	0	0	Right upper quadrant, slight	+	9,600	73	0	91	6	3	
P. I. 15	Chest, right lower quadrant, severe	102	+	0	Left upper quadrant, moderate	+	5,000	41	—	43	10	4	Pleuritis
E. N. 16	Chest, severe	102.4	0	0	0	+	7,400	68	—	24	6	3	
J. B. 16	Chest, moderate	99	0	+	Right upper quadrant, moderate	0	8,200	48	—	70	16	2	Pleuritis
L. F. 17	Chest, epigastric, moderate	99.4	+	+	Epigastric, moderate	+	8,200	51	—	6	4	1	
M. S. 17	Epigastric, severe	100	0	0	Epigastric, moderate	+	17,200	86	—	16	3	2	
H. F. 19	Lumbar, severe	104.4	0	0	Left lower quadrant, severe	0	11,400	81	—	—	8	5	
I. J. 20	Chest, epigastric, severe	100	+	0	Right upper quadrant, moderate	+	6,600	70	—	35	3	2	
G. K. 21	Chest, epigastric, severe	99.8	+	0	Chest, left upper quadrant, moderate	+	7,400	74	0	30	2	1	Pleuritis
L. N. 21	Chest, epigastric, moderate	99.8	+	+	0	+	11,000	69	0	11	3	2	Encephalitis
J. O. 22	Chest, moderate	99.8	+	0	0	+	7,800	71	261	65	3	1	Encephalitis
G. R. 22	Chest, severe	98.6	+	+	Right upper quadrant, severe	0	10,200	41	0	39	12	3	Encephalitis
B. B. 23	Chest, epigastric, moderate	101.4	+	+	Epigastric, moderate	+	9,200	77	—	58	2	1	Urticaria
L. S. 23	Chest, epigastric, moderate	101.6	0	0	Epigastric, severe	+	6,000	47	0	30	3	2	
I. A. 24	Chest, severe	103	+	0	Right lower quadrant, moderate	+	6,600	60	—	40	4	2	
M. Van B. 26	Chest, epigastric, moderate	104	+	+	0	+	8,400	60	57	72	3	1	Encephalitis
R. B. 27	Chest, severe	100.6	0	0	0	0	12,200	73	—	5	6	1	
J. L. 27	Chest, lumbar, moderate	98.6	0	0	Chest, lumbar, moderate	+	8,400	40	—	2	5	1	
F. G. 29	Epigastric, moderate	102.4	0	0	Epigastric, moderate	0	9,550	79	—	—	5	1	Laparotomy, suspected peptic ulcer

The child of a neighbor who lived in the same house as this patient was admitted to the Long Island College Hospital because of similar manifestations. J. O. had held the child in her arms during the interval that she was at home. An abstract of this child's illness is reported in the section on children (case 7, R. B., aged 5 years).

CASE 3.—T. S., a girl aged 14 years, admitted Aug. 8, 1942, two hours before admission, while at the movies, had a sudden intermittent stabbing pain in the right upper quadrant which was aggravated by respiration. She had a chill and fever.

The temperature was 103.2 F., pulse rate 120, respiratory rate 30 and blood pressure 104 systolic and 70 diastolic. The pharynx was slightly injected. There was a slight lag on the right side of the chest with diminished breath sounds, and slight tenderness in the right upper quadrant with some cutaneous hyperesthesia. Roentgen examination of the chest was negative.

Laboratory examination revealed 9,600 white blood cells with 73 per cent polymorphonuclear leukocytes. The urine was normal. The spinal fluid showed a pressure of 170 mm. of water, no cells and a trace of globulin. The sedimentation rate was 91 mm. in one hour.

The pain persisted for about eight hours. Her temperature was normal on August 11 but rose to 102.6 F. the following day with the appearance of pain in both sides of the chest. On August 12 the temperature was normal and the patient was comfortable. On August 13 the temperature was 103.6 F. and there was more pain in the neck, abdomen and lower part of the chest (corresponding to the pattern of diaphragmatic pain, as is true in so many of these cases). On August 14 the temperature was normal and a rapid convalescence followed.

CASE 4.—P. I., a youth aged 15, admitted Aug. 26, 1942, five days before was suddenly attacked with severe pain in the right lower quadrant which was aggravated by respiration. He had headache and profuse perspiration. His temperature was 104 F. The next morning he was symptom free. Thirty-six hours later there was recurrence of pain in the left side of the lower part of the chest, fever, headache and sweating. This bout lasted thirty-six hours and was followed by sixteen hours of freedom from symptoms. All these symptoms recurred a third time some twelve hours before admission to the hospital.

The temperature was 102 F., the pulse rate 76, the respiratory rate 24 and the blood pressure 118 systolic and 78 diastolic. His pharynx was slightly inflamed. There was a slight lag in the left side of his chest and moderate tenderness of the left upper quadrant. Roentgen examination of the chest was negative.

Laboratory examination revealed 5,000 white blood cells with 41 per cent polymorphonuclear leukocytes. The sedimentation rate was 43 mm. in one hour.

TABLE 2.—*Epidemic Pleurodynia—Pediatric Cases*

Name	Age	Pain	Fever	Convulsions	Labored Respirations	Vomiting	Diarrhea	Tenderness	Red Throat	Blood Count: White Blood Cells	Blood Count: Polymorphonuclears, per Cent	Blood Count: Lymphocytes, per Cent	Spinal Fluid	Duration, Days
C. A.	6 mos.	+	100	+++	0	+	0	0	Slight	10,600	59	36	Negative	2
J. H.	10 mos.	+	101.8	++ at home	++	0	0	+	+	8,000	57	42	.....	1
G. M.	12 mos.	+	103	++ at home	0	+	0	+ upper abdomen	+	6,400	44	53	73 cells	1
C. R.	12 mos.	0	105	++	+	+	0	0	+	10,300	43	53	Negative	2
W. B.	15 mos.	+	103	++	0	+	0	0	+	10,300	76	23	.....	3
P. G.	16 mos.	0	104	++ at home	0	0	0	0	++	28,500	84	16	Negative	2
L. D. B.	19 mos.	+	103.8	++ at home	+	+	0	0	++	7,300	53	39	.....	2
D. C.	22 mos.	+	104	+++	++	+	0	++	++	16,800	69	29	Negative	3
R. D.	2½ yrs.	+	102	0	++	+	0	0	++	21,100	83	17	.....	2
H. S.	3 yrs.	++ abdomen	106	++	+++	+	0	?	+	24,500	84	16	Negative	4
T. S.	4 yrs.	+++ abdomen	100	0	++	++	0	+	+++	10,400	76	22	.....	4
R. B.	5 yrs.	+++ head, back and abdomen	104	+	+	0	0	+	+	18,500	77	22	*	2
A. F.	7 yrs.	++ abdomen and chest	104	0	+++	+	0	++ abdomen	++	10,850	80	18	.....	1
J. R.	7 yrs.	++ abdomen	105	0	++	+	0	++ abdomen	++	7,800	75	23	.....	1
M. M.	8 yrs.	+++ upper abdomen	103.4	0	+	+	0	++ upper abdomen	++	18,500	71	26	.....	1
P. T.	10 yrs.	+++ abdomen and chest	103.6	0	+	+	0	++ upper abdomen	+	5,600	29	67	.....	1
R. R.	11 yrs.	+++ abdomen and chest	102.6	0	+	+	0	++ upper abdomen	+	15,540	72	24	.....	1
R. K.	11 yrs.	+++ abdomen	101	0	0	+	0	++ upper abdomen	+	6,100	68	27	Negative	2

* 8/8, 840 cells, 67 % lymphocytes, protein 45; 8/10, 60 cells, lymphocytes 100 %; 8/13, 0 cells, protein 23.

The symptoms and fever subsided on the second day. On the third day he had one further paroxysm of fever and at this time there was pain in the right side of the chest with a pleural friction rub. The pain and fever subsided in sixteen hours but the friction rub persisted for three days.

The boy's father suffered a similar attack with but one bout of symptoms nine days before the patient was taken sick. A brother aged 11 years had a single attack two days before.

PEDIATRIC CASES

CASE 5.—A. T., a boy aged 7 years, three days before admission to the Long Island College Hospital had severe pain high in the right side of the abdomen but no fever. After twenty-four hours he still had this pain, vomited and was moderately incapacitated. On the day of admission he had more severe abdominal pain, vomited and had a temperature of 104 F. He was decidedly prostrated and feverish and had labored, grunting respirations and a definitely reddened pharynx. His abdomen was tender and splinted.

Laboratory examination revealed 10,850 white blood cells with 80 per cent polymorphonuclear leukocytes. The sedimentation rate was 18 mm. in sixty minutes. The urine was normal. Culture of material taken from the throat yielded mixed pneumococci and hemolytic streptococci. Roentgen examination of the chest was negative.

He improved greatly in all respects after twenty-four hours—his temperature became normal and the pain in the abdomen and lower part of the chest disappeared. The pharynx paled and his convalescence was rapid and complete.

Seven other children aged from 2½ to 11 years were admitted because of an almost identical syndrome (table 2). There were 96 additional children seen in the accident room and in the outpatient department who were similarly affected but were cared for at home.

CASE 6.—G. M., a boy aged 12 months, admitted to Long Island College Hospital July 17, 1942, two days before had severe abdominal pain of intermittent character. He became progressively more ill with high fever, and a generalized convulsion of short duration developed while still at home.

On admission he was still twitching and had a temperature of 105 F., pulse rate 134 and respiratory rate 28. His pharynx was red and edematous and there was a purulent postnasal discharge. His abdomen was normal. His neck was not rigid.

Laboratory examination revealed 6,400 white blood cells with 44 per cent polymorphonuclear leukocytes. The urine was normal; spinal fluid was clear, pressure was moderate and there were 73 cells. Culture of material taken from the throat yielded a large number of pneumococci.

There was a decided clinical improvement after twenty-four hours. There were no further convulsions. The temperature ranged between 99.9 F. and 100.6 F. during the second twenty-four hours; then it became normal. The abdominal pain disappeared and pharyngeal injection quickly subsided.

CASE 7.—R. B., a boy aged 5 years, became ill one day before admission with headache, chills and fever. His fever rose, severe pain in the back and neck developed and he was admitted to the hospital Aug. 8, 1942 with a temperature of 104 F. He was prostrated and decidedly drowsy, and there was twitching of his hands and feet. His neck was definitely rigid and there was extreme stiffness of his back. He did not have a convulsion. His throat was very red. His abdomen was tender, particularly in the right upper quadrant and over the liver, which was felt one and one-half fingerbreadths below the costal margin.

Laboratory examination revealed 18,500 white blood cells with 77 per cent polymorphonuclear leukocytes. Culture of material taken from the throat yielded large numbers of hemolytic streptococci. The spinal fluid on admission showed moderately increased pressure, 840 cells with 67 per cent lymphocytes; a test for globulin was positive and sugar was 48 mg. per hundred cubic centimeters. Two days later it showed 60 cells, all lymphocytes; the protein content was 45.6 mg. On the fifth day in the hospital it showed no cells; protein was 23 mg. and sugar 81 mg. Cultures of all specimens of spinal fluid were negative.

After twenty-four hours his temperature was normal and remained so. His neck and back were stiff and troublesome for two to three days. The abdominal pain lasted three days but he was symptom free after seventy-two hours. No weaknesses or other abnormal symptoms remained.

This child had been in direct contact with adult J. O. (case 2), who had meningoencephalitic symptoms. This boy's obvious meningoencephalitic manifestations cleared up with extraordinary rapidity and without sequelae to date. The clinical course, the presence of the epidemic and the contact with adult J. O. appear to justify inclusion of case 7 in this report.

COMMENT

The prominent symptoms in adults were fever and severe pain in the upper part of the abdomen or lower part of the chest or both sufficient to make respiration painful and difficult. The abdominal symptoms were frequently so severe that surgical consultation was sought. The recoveries were prompt, often within twenty-four to forty-eight hours, though recurrent paroxysms of pain and fever were frequent. Frank pleurisy was encountered three times. The Scandinavian writers consider this a rare complication, but in England it was not uncommon, and in one Massachusetts series reported by Locke and Farnsworth the incidence was 14 per cent.

Meningoencephalitis occurred in 5 of our adult patients. This was characterized by headache, apathy, vertigo and photophobia. There was mild nuchal rigidity in a few cases and a positive Babinski sign in 1 case. The spinal fluid usually showed a frank pleocytosis, mostly lymphocytes. The patients all recovered promptly and no sequelae were noted. It is interesting to compare this finding with the high incidence of convulsions observed in the infants seen in this epidemic. Of the 18 children hospitalized with this presumptive diagnosis, 8 were under 2 years (the youngest 6 months) and all had generalized convulsions. None of the children of the 10 who ranged from 2 to 11 years had convulsions.

The pediatric cases depicted in table 2 had in common severe abdominal or chest pain or both, high fever usually of one to two days' duration, labored respirations, moderate vomiting but no diarrhea, severe pharyngitis and quick and complete recovery. Of the 8 under 2 years, all had generalized convulsions of alarming severity. R. B. (aged 5 years) alone of 11 older children had meningoencephalitic manifestations which included drowsiness, twitching, rigid neck and stiff back. He did not have a generalized convulsion.

The leukocyte counts were widely variable and the spinal fluid examinations were normal except that G. M. (aged 12 months) had 73 cells and R. B. had 840 cells when admitted.

Early in July 1942 the first cases among children were believed to be the usual so-called epidemic gastroduodenitis or severe pharyngitis with abdominal pain so vividly described by Brennemann and so common in pediatric practice. However, the case incidence was about 10 a day, at first all from the Red Hook Housing Project and then roughly fanning out from there. The abdominal pain was extraordinarily severe and constant: violent generalized convulsions were seen or reported in most of the infants and in many of the older children who came to the outpatient department or the accident room. This alarming syndrome quickly and completely cleared. There were numerous adult cases at this time with a symptom complex recognizable as epidemic pleurodynia. Only 1 child admitted to our hospital had definite pleuritic involvement, although one of us (C. A. W.) saw an 11 year old girl with obvious pleuritic involvement accompanying the typical epidemic pleurodynia syndrome. So far there have been no recognizable sequelae.

These cases are being reported at the present time, even though the epidemic is still active, for the purpose of calling it to the attention of other observers in the East who may encounter this disease.[12]

CONCLUSIONS

1. Epidemic pleurodynia appeared in Brooklyn in July and August 1942. To date 166 cases have been observed, 40 of which were admitted to the Long Island College Hospital.

12. Since submitting this paper for publication we have encountered only 5 further cases of epidemic pleurodynia. They were in adults, 2 being over 30 years of age, 1 34 and the other 35.

2. An unusually high incidence of pharyngitis has been evident in this epidemic.

3. Abdominal symptoms, as has been emphasized in the course of other epidemics, were sometimes severe enough to suggest an abdominal emergency of a surgical nature.

4. In this epidemic an unusually high proportion of patients exhibited evidence of meningoencephalitis. Practically all of the infants had convulsions.

5. As in other epidemics of this disease, the symptoms have subsided quickly.

6. So far no sequelae have been observed.

340 Henry Street.

CYTOPLASMIC MODIFICATION OF GENETIC TRENDS

WILLIAM F. PETERSEN, M.D.
AND
ALVIN MAYNE, M.B.A.
CHICAGO

Does the condition of the mother influence the developing embryo? This question is one that comes up every so often and we are apt to dismiss it without much thought because we accept the textbook dictum that the development of the human embryo is strictly gene determined. But geneticists today are by no means as dogmatic as they were a decade ago. The vast bulk of the cytoplasm of the egg and its possible significance in modifying genetic trends is receiving more and more attention, and Porter's [1] experiments lend support to this idea.

The observations that we shall present are concerned wholly with the problem in the human being and are therefore based on statistical analysis on the one hand and on the demonstration that environmental impacts (weather as an example) can profoundly modify the bodily chemistry from day to day.[2] Modification of the condition of the maternal body fluids and tissues in which the early development of the embryo takes place leads to the realization of the importance therein implied in modifying genetic trends during the early and very critical stages of development.

The very simplest demonstration of the effect of season is evident in Li's [3] studies of the weight of newborn infants when examined on the basis of the month of conception. At a time when the maternal organism is relatively catabolic the infants conceived are light in weight; in the autumn, when anabolism is accentuated, infants conceived are relatively heavier (fig. 1).

If season, in other words, the cumulative effect of certain environmental situations (chiefly weather and light but integrated with diet and physical activity) can be causative in the fashion here indicated, we must be interested in related possibilities in two diverse directions: (1) the possible effects of long-range trends in the meteorological environment that may be classified as climatic cycles—related in a rather definite way to periods of solar turbulence (sun spot cycles); (2) the possible reflection of shorter trends, namely the effect of individual weather episodes at about the time of conception. This involves the organic reaction to the constantly pendulating cyclonic atmospheric circulation with its brusque atmospheric fronts, the so-called "cold waves" or "heat waves" with which we who live in the northern hemisphere are all familiar.

Will all the fluctuating chemical tides that are thereby initiated bring about changes in the developmental trend of embryos? The investigation of the possible effects on the human being have been extended in several directions and of these we briefly present the following:

The Habitus of the Newborn.—That is, the weight/length ratio, which in turn may reflect either an anabolic or a catabolic trend established in the embryo.

The Weight/Length Ratio of the Adult.—On the assumption that a trend once established in the embryo as observed in the newborn may persist to adult life.

Malformations.—Geneticists accept the possibility that malformations may be induced by genetic or environmental factors. Our observations are therefore directed to the possibility that metabolic factors, initiated by the environmental forces that we have mentioned, may be concerned in the production of such variants.

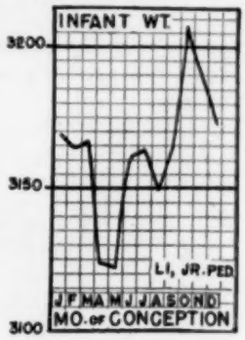

Fig. 1.—Weight of newborn infants by months of conception; 31,000 in the group. (From Li.[3])

Sex Ratio.—Maleness being associated with an increased trend to catabolism (approximately 10 per cent increase in the consumption of oxygen), we have investigated the possibility that the condition of the ovum or the maternal metabolic status might condition the genetic balance and thus exert an influence on the sex ratio.

Disease Susceptibility.—With resistance to disease, longevity, and so on, in part conditioned by habitus and by metabolic trends, the investigation was extended to the possibility that early conditioning of the embryo might find adult reflection in increased or decreased resistance to disease, as finally determined by death certification.

Before proceeding it may be useful to examine these developmental possibilities in the form of a simple diagram (fig. 2). Assuming that the metabolic gradient of the milieu (we can think in terms of oxygen adequacy or inadequacy, p_H levels, potassium/calcium ratio, temperature, hydration or any other organic balance that we may choose because they are all interrelated) pendulates between two poles, the normal genetic trends proceed on a gene determined basis if the swing in either direction is within moderate limits.

If the amplitude of the biochemical swing becomes greater, then gene determined potential may be modified, with a greater tendency to (1) maleness, (2) slenderness, (3) predisposition to characteristic disease potential (schizophrenic, tuberculous), (4) malformation (due to lessened cell cohesion) when the trend is toward greater catabolism, lower p_H and an increase in permeability and so on or to (1) femaleness, (2) broadness, (3) manic-depressive psychosis, (4) mal-

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In the complete reprint of this paper a discussion of the statistical technics employed has been provided.

From the Department of Pathology, Bacteriology and Public Health, University of Illinois College of Medicine.

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Because of lack of space, this article has been abbreviated for publication in THE JOURNAL. The complete article appears in the authors' reprints.

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2. Petersen, W. F., and Milliken, Margaret E.: The Patient and the Weather, Ann Arbor, Mich., Edwards Brothers, Inc., 1934-1938, vols. 1-4. Petersen, W. F.: Weather and Biochemical Variability, Arch. Biochemistry **1**: 269 (Dec.) 1942.

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formation (due to increased cell cohesion or delay in separation) when the pendulum swings too far to the anabolic side at certain critical periods in development.

HABITUS

Starting out on the basis of the observation that the weight of the newborn infant varies with the season of conception, we studied the weight/length ratio of newborn infants and made an examination of over 45,000 obstetric records from six Chicago hospitals, extending over a period of thirteen years. This study revealed striking long-range trends in body proportion of the newborn. The average weight/length [3] ratio of the newborn in each week was computed according to sex. The correlation between a series of ratios for male offspring and a series of ratios for female offspring was high (0.83), indicating that a factor common to all was operative to bring the week-to-week weight/length [3] ratio of the two sexes in harmony.

The curves reveal that broader habitus reached a crest for infants born in 1928-1929; this was followed by a rapid shift toward slenderness in 1930; then followed a reversal of trends to broadness for the years 1933 to 1938, followed by a renewed decline in 1939.[4]

The Variability of Habitus.—When variability of the weight/length [3] ratio was computed by quartile deviation, it was noted that infants conceived in 1928 showed greater variability; then followed greater uniformity for the years 1931-1933, giving way in turn to a second crest of greater variability in 1937-1938.[5]

Thus it would appear that long-range trends in the habitus of the newborn do exist and that for the material presented the cycle was approximately ten years. The crests in variability corresponded to periods of greater sun spot activity.

THE RELATION TO THE WEATHER AT THE TIME OF CONCEPTION

Further analysis of the material with respect to possible causal relationships with barometric pressure [6] reveals striking consistency. It was found that the temperature and barometric pressure of a week or two after the possible conception was most closely related to the habitus of the newborn. The nature of the association between temperature and body stature was consistent from season to season. Regardless of season it was found that the heavier and shorter offspring were

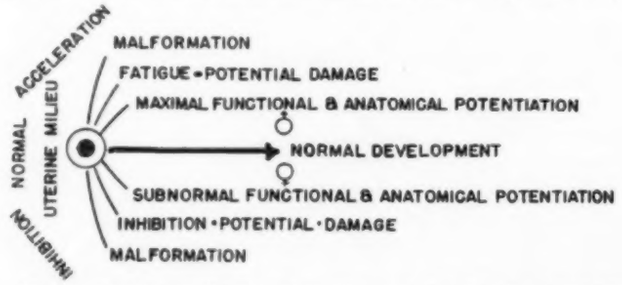

Fig. 2.—Possible modification of genetic trends by diverging trends in milieu with resulting modification of sex, habitus, disease predisposition and anatomic defects.

associated more frequently with presumptive conception at higher temperatures.

MALFORMATIONS

A study of the temperature and barometric pressure movement at the probable period of conception of 1,114 cephalic malformations covering a twelve year period (individual records from death certificates of the Chicago Health Department) indicates that they were conceived under conditions dissimilar to those for normal conceptions. By means of statistical tests it is indicated that the frequency of malformed births under certain

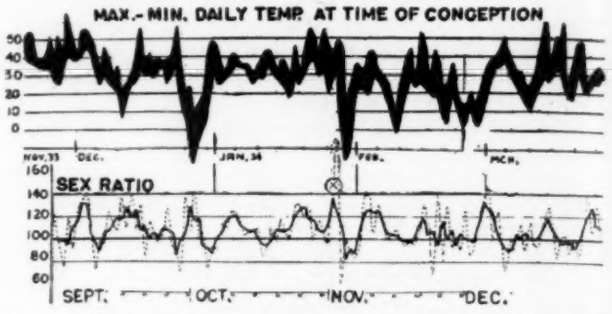

Fig. 3.—Lower curve, sex ratio of the newborn, Chicago births, September, October, November and December 1934. Dotted line, daily ratio. Solid line, five day moving average. Daily maximal and minimal environmental temperatures at conception, superimposed.

temperatures and barometric pressures is sufficiently different from the frequency of normal births under similar conditions to warrant the conclusion that differences cannot be entirely attributable to chance.

SEX RATIO

When one graphs the day-by-day sex ratio of the newborn for a city population (we have made use of Chicago, Detroit and New York records) a most striking pendulation of the sex ratio (fig. 3) becomes evident and when related to the environmental temperature of the presumptive time of conception (280 days before birth) it would appear that the trend to maleness is in some fashion related to periods of increasing cold and the trend to femaleness with periods of greater warmth.

Statistical tests indicate that in three of the four seasons—winter, spring and summer—the temperature deviation from normal and the sex ratio of births 285 days later are associated to an extent which cannot be entirely attributable to chance. In the winter months of conception we may expect that extreme cold or heat on the 285th day prior [12] to birth will be associated with an increase in maleness. During the summer months the same pattern is observable, with a tendency for greater temperatures to be associated more strikingly with the increase in maleness. In the spring months, however, the association is not clear. There appears to be a tendency for increased femaleness to be associated with extreme temperatures.

COMMENT

We have here presented evidence that environmental variability (weather, season, climatic cycles) reflected [17] in corresponding human biochemical and biophysical waves may be a factor in modifying genetically governed developmental trends. Such interference is presumably of significance in conditioning the cytoplasm of the ovum before fertilization or during certain early and critical stages of organic development.

The meteorobiologic integrations here touched on have been studied as part of a broad survey of human reaction to weather. The direct effects in the normal

4. The graph, figure 12, is included in the statistical study.
5. The graph, figure 13, is included in the statistical study.
6. The barometric pressure was used here purely as an index, with the definite reservation that it does not give a comprehensive picture of change in air mass.

12. Both the passage of a polar front as well as high temperature crests can be associated with a transient relative alkalosis and with this a relative anoxia; in turn this will be followed by a relative acidosis.
17. In the organism such periodic impacts set up a series of corresponding biochemical waves, which in turn may be negated or amplified by succeeding environmental impacts of like or diverse origin; undue sensitivity or reactivity of the individual organism, either because of habitus, inadequacy or other reasons, will naturally modify the rhythm.

and sick individual are as obvious today as they were to the hippocratic physician but, as happens not infrequently, the commonplace is apt to be ignored. The more subtle effects, such as those that may involve conditioning of genetic trends here under discussion, while not of immediate medical or pathologic interest, should be considered from the point of view of organic selection, of adaptation and of human evolution.

Actually our observations merely confirm the earliest recorded statement on heredity, namely "wherefore it is natural to realize that generation, too, varies in the coagulation of the seed and is not the same for the same seed in summer as in winter nor in rain as in drought" (Hippocrates: Airs, Waters, Places).

ABSTRACT OF DISCUSSION

DR. ALVIN MAYNE, Chicago: The variations from day to day in sex ratios in the weight-length ratios and in the frequency of malformations cannot be attributed merely to chance, but there exist factors that do influence the variations significantly. In many of these studies we have used a large population. For example, in our studies on sex ratio we have studied the births of over thirty thousand offsprings. In our study on weight-length ratio we used over 45,000 observations, and in our study of malformations we compared a thousand malformations to a normal population of births of over thirty thousand. Hence, while the relationships to certain factors of environment may be slight, because of the large numbers we have shown that they could not have been due to chance. There must be some factors common to the entire population, and one might have been the diet of the population. However, we have no records of the diet of the mothers at the time of conception, and we can almost rule out racial and heritage factors because these data are from the city of Chicago with a diverse racial population. The environmental conditions are common to nearly all of the population; that is, in general the mothers have been exposed to the variations in temperature and barometric pressure and air masses that pass over the city of Chicago. We have records on the weather in Chicago that we can date back to the probable time of conception. We have made use of this material principally because we feel that that is one of the common factors involved. I have broken up the sex ratio of 33,000 babies into four groups: whether they were conceived in winter, spring, summer or autumn. We have fairly good evidence that about two hundred and eighty-five days before birth the temperature does have some effect on the sex ratio of the offspring. We can draw conclusions because the probability that such relationships as we have found exist merely through chance is small, and in each case in winter, spring and summer the probability is less than one out of a thousand, by using the latest statistical methods.

Control of Body Weight.—We have seen that surplus calories of ingested food, whether taken in the form of protein, fat or carbohydrate, tend to accumulate in the form of body fat. And overfatness always means that the intake of food calories has been out of proportion to the expenditure of energy by the person concerned. There is more tendency to overweight in some people than in others, and undoubtedly this sometimes extends beyond the question of appetite to endocrine and perhaps other constitutional differences; yet the fact remains that for the individual the control of body weight is essentially a matter of a proper balance between what is ingested as food and what is oxidized in the energy metabolism. If one tends to become too fat, the remedy is to eat less or to burn more.—Sherman, Henry C.: Chemistry of Food and Nutrition, New York, Macmillan Company, 1941.

Clinical Notes, Suggestions and New Instruments

TANTALUM AS A METALLIC IMPLANT TO REPAIR CRANIAL DEFECTS

A PRELIMINARY REPORT

LIEUTENANT COMMANDER O. HUGH FULCHER, MC-V (S), U. S. N. R.

Cranial defect in military surgery represents a most important problem because of the frequency of occurrence and because it renders a man unfit for military duty unless it can be adequately repaired. Therefore an adequate method of repair is urgent—one which can be performed by the general surgeon as well as by the neurologic surgeon in any ordinary general hospital wherever it may be located. Moreover, the repair should render protection to the intracranial structures against blows, changing atmospheric pressures and changing bodily positions which should approximate that afforded by the normal cranium. The convalescence following the operative procedure should be brief to keep "as many men at as many guns as many days as possible."

Fig. 1.—The cranial defect destroys the left boss of the forehead.

Fig. 2.—Cosmetically the defect involves a part of the face.

REPORT OF CASE

R. A. P., aged 23, a fireman, second class, attached to submarine duty, had received a compound depressed fracture of the left frontal region on May 5, 1941 when struck by a closing compartment door of a submerged submarine. On regaining consciousness a few minutes later he found himself in the sick bay with his head bandaged. Two days later some cranial fragments were removed at a naval base hospital. Subsequently he was transferred to another naval base hospital where a second operation was performed which consisted of removing bony fragments. He was transferred to U. S. Naval Hospital, Washington, D. C., on October 15 for further treatment.

On admission the complaint consisted of annoying pulsation in the area of the cranial defect, recurring attacks of frontal headaches, vertigo and a sensation of impending syncope on change of position. He was annoyed by the bulging of the area over the cranial defect on bending over and a concavity

Read before the Washington Academy of Surgeons, April 10, 1942. The tantalum used in this case was furnished by Fansteel Metallurgical Corporation, North Chicago, Ill.

of this area on standing. He feared crowds because of the curiosity and questions evoked by his appearance. He was mentally depressed because he had been advised that the craniocerebral injury had rendered him unfit for further active military duty. He had lost 20 pounds (9 Kg.) since the accident.

Fig. 3.—The cranial defect measures 3 by 4 cm. There are some depressed bony fragments along the anterior margin.

Fig. 4.—The tantalum plate has been reduced to correct size by tin snippers, hammered into desired contour and fitted to mold. It is prepared for insertion.

Examination revealed that he was moderately well nourished with a conspicuous cranial defect involving the left frontal boss which measured about 4 cm. in diameter (figs. 1 and 2). The overlying soft tissue was depressed and pulsating and had two vertical scars. When the patient strained or bent forward the overlying tissue would bulge, and the patient complained of vertigo, tinnitus and a sensation of fainting. In the prone position the overlying skin would also bulge. The temperature, pulse and blood pressure were within normal limits. The remainder of the physical and neurologic examinations revealed only normal conditions.

Roentgen studies of the cranium revealed a large rounded defect about 3 by 4 cm. in the left frontal region several centimeters above the orbit. The anterior edge showed a shelving margin which projected inward about 2 cm. and which represented depressed fragments of bone (fig. 3).

Another surgical procedure was deemed necessary to remove the remaining depressed fragments of bone and to repair the cranial defect. Furthermore, the cranial defect involved the face, and the patient was anxious to have the facial symmetry restored.

Capt. F. R. Hook of the Medical Corps suggested the use of a tantalum plate to repair the cranial defect. He had used tantalum plates in orthopedic procedures and had demonstrated by reoperating eight months after the insertion of the plate that bone during regeneration would incorporate the metal and that soft tissues would adhere to it. Mr. I. R. McCall,

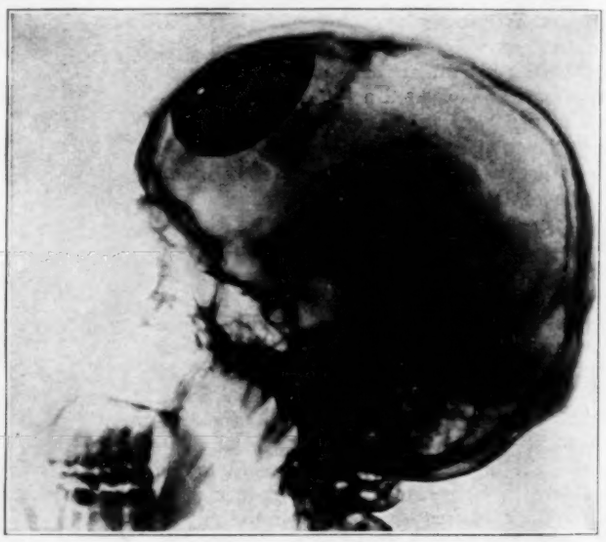

Fig. 5.—Tantalum plates snugly placed in inlay covering the cranial defect, five days after operation.

a metallurgist, determined by experiment that the plate should be 25 mills thick to render adequate protection. Dr. C. C. DeFord of the dental corps prepared a mold of the cranial defect. The plate was then cut approximately to the correct size by means of tin shears and hammered to the desired contour, which could be determined by the mold and by adjusting the plate over the right frontal boss of the patient. Following this, the plate was further trimmed to the perfect size. Three perforations were made to permit the escape superficially of any serum that might collect beneath the plate in situ (fig. 4). It was sterilized by boiling.

On November 24 the cranial defect was explored under local anesthesia by excising the lateral vertical scar present. The dura appeared intact, but there were two depressed fragments of bone along the medial border of the cranial defect which were removed. The pericranium about the border of the cranial defect was elevated, the prepared tantalum plate laid in place and its size marked by means of a sharp knife. The plate was then removed and a bed prepared by the use of a chisel and a motor driven emery wheel. The depth of this bed was equal to the thickness of the tantalum inlay so that there would be no elevation or depression at the junction of the bone and metal. The plate was then dropped in place, the available pericranium placed over its border and the skin closed with fine dermal sutures (fig. 5). The patient remained in bed only two days, and the convalescence was uneventful.

On November 29 the sutures were removed and about 4 cc. of bloody fluid was aspirated. On December 10 he was granted a leave for four weeks to visit his home, during which time his activities were not restricted and he was entirely free of all symptoms. The cosmetic result was satisfactory (figs. 6 and 7) and the plate offered ample protection to the intracranial structures.

The patient returned from his sick leave on Jan. 8, 1942, anxious to return to active duty. He was mentally alert, liked social life and was completely adjusted. On January 13 and 14 a thorough examination was made to determine his qualification for submarine duty, which included his ability to withstand an air pressure of 50 pounds to the square inch. He passed this test satisfactorily and on January 16 was returned to submarine duty on a North Atlantic patrol.

COMMENTS

This patient was completely rehabilitated within two months of the operation for repair of the cranial defect. Thus a highly trained submarine fireman who could not have been replaced immediately was retained on active duty. Moreover, he had been rehabilitated socially to the extent that he had regained his former personality. He possessed his normal appearance, with the exception of two scarcely visible vertical scars in the region of the left side of the forehead.

It is not necessary to make a bed in the cranium to receive the plate as it was placed on the bony border about the defect in another case with equally good result. A bed for the metallic inlay was desirable in this case for cosmetic reasons. Otherwise there would have been a slight elevation about the border of the plate.

In 1939 Grant and Norcross [1] reviewed the literature on the methods used for repairing cranial defects and reported their experience with the craniopericranial graft. A study of their excellent work clearly demonstrated that there existed no adequate method for repairing cranial defects at that time. Since then Lipscomb and Grover,[2] Geib,[3] Peyton and Hall [4] and Beck [5] have reported the use of vitallium plates with good results. However, vitallium is an alloy which must be cast and will not lend itself to hammering; it cannot be cut or bent. Since the mold for casting is made over the soft tissues and since the soft tissues do not accurately represent the cranial contour or defect, the plate rarely fits snugly and usually requires a compromise in adjustment. Furthermore, casting is frequently impracticable in some military hospitals.

Fig. 6.—Appearance sixteen days after operation.

Tantalum is element 73 of the periodic table. It has approximately the physical properties of cold rolled steel and the chemical properties of glass. It can be secured in plates or sheets of any size desirable, and the thickness should be 25 mills. It is inert and can be cut, bent or hammered, and of course it can be sterilized by boiling or by any recognized chemical method. It will give protection at the thickness of 25 mills, which will approximate that of the normal cranium.

Lieut. (j.g.) R. H. Pudenz of the Medical Corps has demonstrated by animal studies and by biopsy of the scalp of one of my patients that soft tissues will adhere to tantalum to the extent that it has to be removed by a periosteal elevator, which corroborates the the observations of Captain Hook. Thus it may be possible in many instances to repair the cranial defect by the use of a tantalum plate at the time that the bony fragments are removed immediately following injury. If this is done, sulfanilamide powder should be "dusted" into the wound and on each side of the plate. Complete hemostasis is imperative.

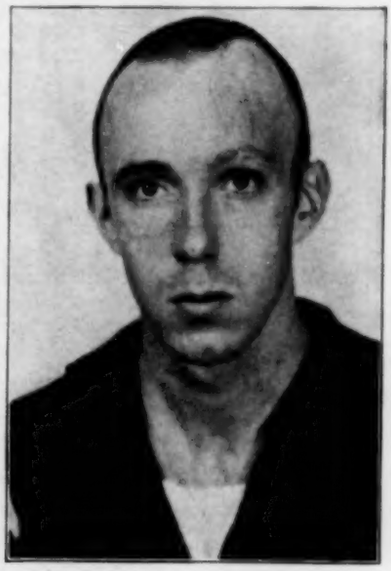

Fig. 7.—Note symmetrical contour of forehead.

Tantalum plates of 25 mill thickness for repair of cranial defects should be included in the surgical supplies of every general military hospital.

CONCLUSION

The method described of repairing a cranial defect involving a part of the face by the use of a tantalum implant has afforded protection to the intracranial structures approximating that offered by the normal cranium. The convalescence in my case was brief and the normal facial contour was restored.

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3. Geib, F. W.: Vitallium Skull Plates, J. A. M. A. **117**: 8-12 (July 5) 1941.
4. Peyton, W. T., and Hall, H. B.: Repair of Cranial Defect with Vitallium Plate, Surgery **10**: 711-715 (Nov.) 1941.
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RECURRENT INTRACRANIAL HEMORRHAGES IN A PATIENT WITH HEMOPHILIA

SAMUEL BAER, M.D.; HAROLD L. GOLDBURGH, M.D., AND BEATRICE PEARLSTINE, M.D., PHILADELPHIA

Surprisingly little has been added to our knowledge of the etiology and pathogenesis of hemophilia since it was first described as a distinct clinical entity by Otto in 1803. There is still some discussion concerning the essential clinical features of the condition. Most observers, however, agree that hemophilia is a blood dyscrasia occurring almost exclusively in males and transmitted according to mendelian laws of inheritance by the female. The disease is characterized by a history of repeated hemorrhages, a prolonged clotting time and a normal bleeding time.

Trauma almost invariably precedes hemorrhagic episodes, according to Eley.[1] A fracture, contusion, laceration or surgical procedure of even the most minor degree may start the bleeding. Approximately 75 per cent of the cases present orthopedic complications (hemarthroses) of some sort.[2]

All are agreed that hemorrhage into the central or peripheral nervous system is very unusual. In a complete review of the literature prior to 1911 Bullock and Fildes [3] found only 19 cases of hemophilia in which there were neurologic complications. In 14 of these intracranial hemorrhages were noted. From 1911 to 1930 Seddons [4] found mention of only 1 case

From the Medical Service of Dr. Harold L. Goldburgh, Jewish Hospital.

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2. Sturgis, C. C.; Isaacs, Raphael; Goldhammer, S. M., and Bethell, F. H.: Review—Blood, Arch. Int. Med. **64**: 162 (July) 1939.
3. Bullock, W., and Fildes, Paul: Hemophilia, in Treasury of Human Inheritance, London, 1911.
4. Seddons, H. J.: Hemophilia as a Cause of Lesions in the Nervous System, Brain **53**: 306 (Oct.) 1930.

of damage to nerve tissue by hemophilia. Of the 29 cases of Seddon's series, only 2 presented neurologic lesions and none intracranial bleeding.

It can be seen, therefore, that intracranial bleeding occurring in a hemophiliac is a rather rare complication. Our patient exhibited at least two and possibly four episodes of such hemorrhage.

Fig. 1.—Large clots attached to under surface of dura.

REPORT OF CASE

History.—W. R. was born May 27, 1920 and, until his death at the age of 22, his history was characterized by repeated hospitalizations.

When circumcision was performed ten days after birth he bled for twelve hours. Transfusions were required to help stop the bleeding.

His first admission to the Jewish Hospital was at the age of 15 months. A known hemophiliac, he was admitted for treatment of bleeding gums. Hospitalization occurred again in 1923 at the age of 3 years. The diagnosis on admission was meningismus. Continuous vomiting had been present for three days. Examination revealed nuchal rigidity, a positive Kernig sign, a positive Babinski sign and some hyperesthesia. Spinal puncture was not performed.

In 1924 he was admitted a third time for treatment of continuous bleeding resulting from a laceration of the lip. Three years later he was hospitalized for bleeding following the accidental loss of a tooth.

At the age of 13 he was again referred to the Jewish Hospital, this time for treatment of a spontaneous subarachnoid hemorrhage. It was discovered at this time that he had been treated for a similar episode at another hospital two years previously. Two spinal taps were grossly bloody, and laboratory studies revealed a moderate hypochromic anemia, a bleeding time of three and one-half minutes and coagulation time varying from nine to nineteen and one-half minutes.

His sixth and final admission occurred Sept. 1, 1942 at the age of 22. He was admitted to the medical service of Dr. Harold L. Goldburgh complaining of severe headache and vomiting of three days' duration. One convulsion had occurred the day prior to hospitalization. Examination revealed a heart rate of 50 and evidence of multiple joint deformities (hemarthroses). Neurologic examination revealed hyperactive deep tendon reflexes and a positive Babinski sign on the right side. Spinal fluid was grossly bloody. Laboratory studies were consistent with the diagnosis of hemophilia (bleeding time two and three-fourths minutes, clotting time thirteen and one-half minutes, normal vitamin C level and normal prothrombin time).

Evidence of increased intracranial pressure persisted. The headache became worse, the temperature rose to 104-105 F., nuchal rigidity was severe and inequality of pupils was present. Stupor became deeper and severe opisthotonos and facial asymmetry became apparent. A cerebral cry was almost constantly present.

Treatment was wholly ineffective. Transfusions had to be discontinued because of the development of autoagglutinins. Widespread hemorrhages occurred in the skin and at various points of pressure. Death occurred on September 16, sixteen days after admission.

Autopsy.—Examination three hours post mortem revealed emphysema, patchy pneumonitis at the right base and gastric and retroperitoneal hemorrhages. There was a left parieto-frontal encephalomalacia and a large subdural hematoma. A detailed neuropathologic examination was made by Dr. N. W. Winkelman, whose report is here given:

Gross Examination: The brain was small and extremely bloody. The outstanding feature was the presence of well organized clots under and attached to the dura on both sides. This was especially noticeable on the left side, where the clot reached a thickness of almost 4 cm. (fig. 1). This point was reached in the form of a nodule which was in the superior parietal area. It had compressed the underlying brain structure so that it was flattened; it acted in the same way as an overlying meningioma. The clot on the left side was ragged and irregular but larger than the one on the right, which was much thinner and had not greatly compressed the underlying cortical tissue.

There was blood not only in the subdural space bilaterally but also in the subarachnoid space. It was not, however, primarily subarachnoid bleeding but apparently had broken through the arachnoid. While the entire soft meninges were blood stained, they were not overfilled with blood. Only in relation to the large blood "nodule" was there an excess amount of blood filling the convolutional interspaces.

At the base of the brain there was an excessive amount of blood and the structures stood out clearly. The blood vessels were small, bluish and not sclerotic.

Sections through the pons, medulla and cerebellum showed no gross evidences of bleeding or any other gross lesions. There was, however, considerable congestion.

Section through the brain showed no ventricular dilatation. There was only moderate congestion. There was no intracerebral bleeding. The left parietal lobe beneath the large blood clot was seen to be compressed and distorted (fig. 2). The tissue beneath was necrotic but not hemorrhagic. This area of necrosis occupied the posterior part of the inferior

Fig. 2.—Note the compression of the left parietal lobe by the large blood clot.

parietal lobe and extended into the occiput. The compression caused by the blood clot had compressed the lateral ventricle and shifted the structures slightly past the midline. A great deal of blood was present in the subarachnoid space in relation to this large subdural clot.

Gross Diagnosis: There were massive subdural hematomas (especially on the left side), moderate subarachnoid hemorrhage, compression and degeneration of the left parieto-occipital areas.

COMMENT

This case presents a number of unusual features. A spinal puncture was not done at the second admission in 1923 but in the light of our present knowledge the history is certainly suggestive of a subarachnoid hemorrhage. At the age of 11, the patient probably had another episode of intracranial bleeding treated at another institution. At the age of 13 and again at 22 he exhibited the classic symptoms of sudden spontaneous intracranial bleeding. With none of these attacks was there any history even suggestive of preceding trauma.

In view of the usually unsatisfactory response to treatment (including transfusions) noted so frequently in cases of hemophilia, it is amazing that this patient weathered three attacks of intracranial bleeding. Harper [5] has reported recovery from a cerebral hemorrhage in a hemophiliac patient aged 4 years.

Little if any mention is made in the various neurologic textbooks [6] of intracranial bleeding in hemophilia. Priest [7] has reported a case of acute spinal compression in hemophilia. Arbuse and Locascio [8] discussed the neurologic manifestations of hemophilia. They stated that hemorrhages were usually single and post-traumatic but might be multiple. Bleeding was generally from the pial vessels, and central hemorrhages were more common than peripheral lesions.

It seems logical to conclude that this patient not only suffered a spontaneous intracranial hemorrhage as a complication of hemophilia but apparently survived three such crises. The final episode was characterized by massive spontaneous bilateral subdural hematomas.

SUMMARY

A hemophiliac patient had multiple bilateral spontaneous intracranial hemorrhages. Death at the age of 22 was preceded by recovery from at least one and possibly three attacks of spontaneous subarachnoid bleeding.

6300 Rising Sun Avenue—1932 Spruce Street.

SHOCK IN PHYSICALLY INDUCED FEVER THERAPY TREATED WITH BLOOD PLASMA

LIEUTENANT ARTHUR M. PRUCE
MEDICAL CORPS, ARMY OF THE UNITED STATES

This report on the use of plasma in the treatment of secondary shock following physically induced fever is presented because our armed forces have instituted a rapidly expanding program of fever therapy to treat venereal diseases. Shock is one of the more dangerous complications which may occur during or several hours after sustained high temperature rises induced by physical means. There are no significant differences in the picture of secondary shock whether caused by trauma, surgery or fever therapy. Although plasma has been widely and successfully utilized to combat shock from other causes, this appears to be the first report to describe its use in shock following fever therapy.

REPORT OF CASE

Private J. D. M., a Negro aged 20, was sent for fever therapy because of a chronic sulfonamide resistant gonorrhea of five months' duration. He had a moderately profuse urethral discharge. The prostate culture and urethral spread were positive. It was intended that he receive eight hours of therapeutic fever of between 106 and 106.7 F. The usual prefever routine was carefully observed. This routine included a thorough survey of the heart, lungs, kidney function, complete blood count and blood chemistry including determination of blood sugar, nonprotein nitrogen and chlorides. Premedication consisting of the administration of 16 Gm. of sulfathiazole, 4 Gm. of calcium gluconate and 150 mg. of ascorbic acid in divided doses was started three days prior to treatment. A final clinical check was made by a medical consultant, and the patient was accepted for treatment. Four cc. of paraldehyde was given orally in the morning one hour before treatment was started.

At the onset of the treatment the only abnormality was a rapid pulse, 104 a minute. With a mean hypertherm cabinet temperature of 115 F., the patient's body temperature had attained the therapeutic level of 106 F. in seventy-two minutes.

After three and one-half hours of fever at the therapeutic level of between 106 and 106.6 F. by rectum, there was onset of headache and restlessness. The patient had taken fluids by mouth poorly and had vomited repeatedly—five times in the preceding two hours. To replace the fluid lost in vomiting and combat fluid loss in perspiration, 3,000 cc. of 5 per cent dextrose in isotonic solution of sodium chloride was given intravenously during these three and one-half hours.

Oxygen was administered intermittently for the headache and restlessness, which are so often found to accompany this type of treatment and are the result of cerebral anoxia. During the following two hours of treatment the patient's restlessness increased. At the end of five and one-half hours of treatment his blood pressure fell to 78 systolic and 44 diastolic and the pulse rate rose to 156 and projectile vomiting developed. The sudden rise in the pulse rate and the fall in blood pressure indicated impending vascular collapse. This, together with continued evidence of cerebral irritation, forced discontinuance of the treatment.

To combat the impaired peripheral circulation and the possible cerebral edema, 40 cc. of 50 per cent dextrose intravenously was twice given and continuous oxygen with the Boothby-Lovelace-Bulbulian mask was used. The blood pressure responded to this by a rise to 92/60 and the pulse dropped to 112. When the patient returned to his ward, his temperature was normal.

In the subsequent six hours in the ward his blood pressure rose to 110/60 and his pulse was regular, but the vomiting persisted. To combat this loss of fluids and chlorides by mouth he received 2,000 cc. of saline solution intravenously. That evening at 9 o'clock, six hours after discontinuance of treatment, the patient went into shock, and his temperature fell to 96.7 F. rectally. He became confused and then stuporous. The blood pressure fell to 80/52 and the pulse became thready and rose to 140 beats a minute. His respiratory rate jumped to 32.

Oxygen, with the patient in antishock position, 1,000 cc. of 5 per cent dextrose in isotonic solution of sodium chloride intravenously and two doses of 50 cc. of 50 per cent dextrose together with warm blankets were unsuccessful in relieving the shock. At this point trial use of blood plasma was advised. Two hundred and fifty cc. of plasma was administered intravenously in fifteen minutes. A rapid change occurred in the clinical picture within the next twenty minutes. The patient's sensorium cleared, his blood pressure rose to 106/64, the pulse became regular and strong and fell to 80 beats a minute. His respiratory rate became normal and the rectal temperature rose to 98.6 F. This appears to be the first case in which plasma was used successfully to combat shock following physically induced fever therapy. Interestingly enough, the patient was cured of gonorrhea in spite of only five and three-quarters hours of therapeutic fever.

SUMMARY

Shock following physically induced fever therapy was successfully treated by the intravenous injection of 250 cc. of blood plasma after the usual accepted antishock measures including intravenous isotonic solution of sodium chloride and hypertonic dextrose and oxygen had failed. This appears to be the first report on the use of plasma in shock from this form of treatment and emphasizes the importance of the use of plasma in the treatment of secondary shock from all causes.

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From the Surgical Service, Stark General Hospital, Charleston, S. C. Lieutenant Pruce is chief of Section of Physical and Fever Therapy.

Released for publication by the War Department Manuscript Board, which assumes no responsibility, other than censorship, for the contents of this article.

Special Clinical Article

MANSON'S SCHISTOSOMIASIS

CLINICAL LECTURE AT ATLANTIC CITY SESSION

ENRIQUE KOPPISCH, M.D.
SAN JUAN, PUERTO RICO

There are important reasons why physicians in all parts of North America should devote increasing attention to diseases of the tropics. First, many of those who in less tragic times would almost certainly never have seen service in tropical lands will sooner or later be confronted with such a contingency. Second, there can be little doubt that some of these diseases will be contracted by our soldiers and brought back with them as they return to the homeland on furlough or definitively.

As regards schistosomiasis, the problem with homecoming troops will probably be one mainly of diagnosis for the physicians of this country who may be called on to take care of such cases. From the public health point of view, no difficulties should perhaps be expected, for of the known planorbids of the United States none have yet been proved, to my knowledge, capable of acting as intermediate host. One cannot, however, until an exhaustive survey is made, be certain that none of them can act in that capacity.

Of the three forms of schistosomiasis—the Oriental or Japanese, the vesical or urinary and the mansonic or so-called intestinal—I shall limit my discussion to the last named.

GEOGRAPHIC DISTRIBUTION

Manson's schistosomiasis is a disease of extended geographic distribution and of great importance as a morbidity and mortality factor in those regions in which it occurs endemically.

Africa, northern South America and the Caribbean region are the great endemic foci. In northern Africa it is found in the lower Nile Valley, particularly in the Delta, and in the Sudan. It is present along the East African coast from Zanzibar to below the Zambezi River, and in the island of Madagascar. In central Africa it occurs throughout parts of Tanganyika, the Belgian Congo and Rhodesia. To a limited extent it is present in Natal and the Transvaal. In West Africa it is seen in Senegal, French Guinea and, sparsely, as far as Lake Chad. Cases have been found in Liberia, Sierra Leone, Algeria, Harar (Ethiopia), Eritrea, southern Tunisia and Cyrenaica, but in these regions no important endemic zones have been encountered. There is a small endemic focus in Yemen, Arabia. In Egypt alone Scott [1] estimated in 1937 that there were 3,000,000 cases of Manson's schistosomiasis.

In the New World it occurs in parts of northern and northeastern Brazil, with a variable incidence which in one locality of the state of Minas Geraes has reached 85.18 per cent.[2] Total figures for Brazil are unknown. In Venezuela its distribution so far seems restricted to a limited part of the north central zone, where according to Scott [3] 60 to 80 per cent of the population in the valleys near Caracas are infected. The disease is fairly common in Dutch Guiana.

Among the islands of the Caribbean, schistosomiasis is present in Puerto Rico, Vieques, St. Martin, St. Kitts, Nevis, Monserrat, Antigua, Guadeloupe, Martinique and St. Lucia. In Puerto Rico, 14.6 per cent of the autopsies performed in San Juan, a nonendemic center with a population of about 170,000, have presented evidences of the disease.[4]

Its incidence is greatest among those in the second and third decades of life, but it affects the two sexes to about the same extent except in regions in which occupation or habits may result in more chances of exposure on the part of members of one sex.

LIFE CYCLE OF PARASITE

For the completion of the parasite's life cycle a specific intermediate molluscan host is necessary. In Puerto Rico, as in most of the endemic foci of the Western Hemisphere, the snail concerned is Australorbis glabratus. Given suitable climatic and hydrographic conditions, a miracidium is hatched when the human feces containing ova of Schistosoma mansoni reach the water. It swims about until it finds a snail of the appropriate species, which it penetrates and parasitizes. Within the snail the miracidium undergoes morphologic alterations and great multiplication, resulting, at the end of twenty-two to thirty-one days, in the emergence of large numbers of fork tailed cercariae.

The disease is acquired through exposure to cercariae, usually while bathing in infected streams or working in irrigation canals, but infection can also take place through the buccal mucosa while drinking. The body of the cercaria penetrates by boring through the epithelium of either the skin or the mucous membrane, the tail dropping off as soon as the body secures a firm hold. After penetration, and until maturity is reached, the parasite is referred to as a metacercaria.

PREVENTION

From what has so far been said of the life cycle and mode of infection, it is clear that spread of the disease can be avoided by (1) curing all who are affected with it, so that no more viable ova will pass with their feces; (2) preventing the contamination of bodies of water with human excreta; (3) exterminating the snails or cercariae, and (4) keeping the people away from the sources of infection. One or more or all of these methods may be applicable with success in a few communities, particularly in small ones, but in the larger endemic foci the density of population and extent of infested territory make these methods unpractical at the present time. Truly tangible results will perhaps not be forthcoming until education of the masses is much more advanced than at present, until medical care in tropical countries is more widespread and efficient and until the standard of living of the average individual in those areas is materially improved.

PATHOGENESIS, EXTRUSION OF OVA AND PATHOLOGY

The usual route of penetration is through the skin. Since the metacercariae are next found in the lung, it is clear that in the derma they must enter either lymphatics or veins. In experimental inoculations of

From the Department of Pathology, School of Tropical Medicine.

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1. Scott, J. Allen: The Incidence and Distribution of the Human Schistosomes in Egypt, Am. J. Hyg. **25**: 566 (May) 1937.
2. Martins, A. Vianna, and Dos Anjos, W. Versiani: "Schistosomose mansoni" no norte de Minas Geraes, Brasil-med. **52**: 812, 1938.
3. Scott, J. Allen: Schistosomiasis in Irrigated Mountain Valleys of Venezuela, Am. J. Hyg., Sect. D **31**: 1 (Jan.) 1940.
4. Koppisch, Enrique: Studies on Schistosomiasis Mansoni in Puerto Rico: VI. Morbid Anatomy of the Disease as Found in Puerto Ricans, Puerto Rico J. Pub. Health & Trop. Med. **16**: 395 (March) 1941.

white rats with Schistosoma japonicum Watarai [5] saw the parasites within both blood vessels and lymphatics. In the rabbit, on the other hand, in an examination of more than 3,500 serial sections of skin taken from one to fourteen hours after exposure, at intervals of one hour, I [6] found parasites only in lymphatics (fig. 1) of the derma. For man it is not exactly known which of the two routes is usually selected, but it is generally taken that they pass into veins.

The course followed by the metacercariae seems at all times to be strictly intravascular. Those which are not caught and destroyed in the pulmonary circulation reach the left side of the heart, whence they are ejected with the arterial blood to all organs and tissues. Some of them obstruct capillaries, giving rise to petechial hemorrhages, and a great many are undoubtedly lost during the period of wandering. Finally, those which reach organs and tissues whose venous drainage is by way of the portal vein seem to be the only ones that survive and establish a foothold in the mammalian host. By passing from the arterial to the venous side in organs like the spleen, pancreas, liver, stomach and small and large intestine, they reach intrahepatic portal branches, where they attain maturity. It seems probable that some of the parasites may pass through the liver and lungs more than once.

Fig. 1.—Cercaria in lymphatic next to a hair follicle of an experimentally infected rabbit four hours after exposure (× 400). Originally published in the Puerto Rico Journal of Public Health and Tropical Medicine.[6]

Mature or almost mature males and females wander against the blood current and copulate in the larger venous tributaries of the portal vein, showing a strong and unexplained preference for the lower colonic and rectal branches. For deposition of the ova, the females wander on, usually alone, into visceral venules which they fit snugly, this usually taking place in the large intestine.

The mechanism by which ova pass from the blood vessels in which they are deposited into the tissues has been the subject of much controversy. With variations in certain details, most of the interpretations have been to the effect that the process is one of progressive accumulation of ova in a blood vessel the wall of which is ultimately ruptured thereby,[7] of forceful ejection by pressure exerted by the blood,[8] of ejection by the pressure exerted by movements of the tissues of the host [9] or of tearing of the wall by means of the spine of the ovum.[10] According to our observations,[11] conducted on properly selected human and animal tissues sectioned serially, the ovum comes to lie against the endothelial lining of the venule in which it is laid or, in the case of the liver, to which it is carried with the blood stream. Immediately after this the endothelial cells extend from all sides by multiplication and cover the ovum completely, thus excluding it from the circulation (fig. 2). An inflammatory reaction, to a minor extent exudative and mainly proliferative (pseudotubercle formation), then develops about the ovum, and the venule is either pushed aside or obliterated. The way in which it passes into the lumen of the intestine is not explained by these observations. It is possible that only ova that are laid immediately beneath the epithelium can ever reach the outside through areas of ulceration or of accidental abrasion, aided perhaps by the intestinal movements and the passage of the feces. My observations help me to understand why ova with a terminally placed spine (Schistosoma haematobium) and others with practically no spine (S. japonicum) leave blood vessels as readily as those of S. mansoni with its well developed lateral spicule.

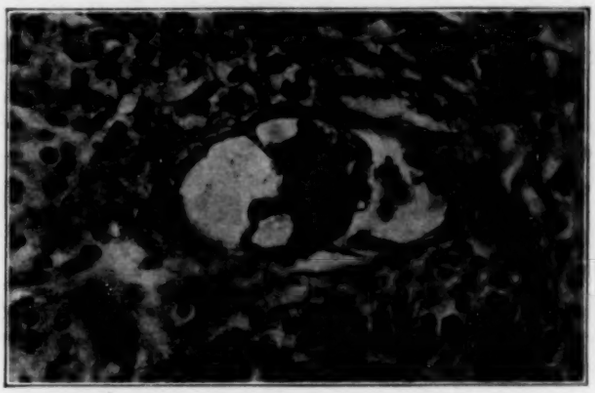


Fig. 2.—Extension of endothelial lining of venule about schistosome ovum. Experimentally infected monkey (× 450). Originally published in the Schweizerische Zeitschrift für Pathologie und Bakteriologie.[11]

It is probable that in man most of the damage is accomplished by the ova. The characteristic mode of reaction of the tissues in all organs to the presence of these structures is by the formation of a pseudotubercle. First polymorphonuclear leukocytes surround the ovum, if the embryo is still present (fig. 3). Fre-

5. Watarai, Jiro: Studies on the Skin Reaction Caused by Schistosoma Japonicum, Cutaneously Applied on the Animals, Jap. J. Exper. Med. **14**: 1-18 (Feb. 20) 1936.

6. Koppisch Enrique: Studies on Schistosomiasis Mansoni in Puerto Rico: IV. The Pathological Anatomy of Experimental Schistosomiasis Mansoni in the Rabbit and Albino Rat, Puerto Rico J. Pub. Health & Trop. Med. **13**: 1 (Sept.) 1937.

7. Blanchard, R.: Traité de zoologie médicale, Paris, 1889, vol. 1, p. 648.

8. Letulle, M.: Arch. de parasit. **9**: 392, 1905.

9. Lortet and Vialleton: Ann. Univ. Lyon. **9**: 1, 1894.

10. Manson-Bahr, Philip, and Fairley, N. H.: Parasitology **12**: 33 (Jan.) 1920.

11. Kohlschütter, E., and Koppisch, Enrique: On the Mode of Extrusion of Schistosome Ova from Blood Vessels into the Tissues, Schweiz. Ztschr. f. Path. u. Bakt. **4**: 357, 1941. Koppisch.[4]

quently, however, the embryo has died and been absorbed by the time extrusion has taken place, and then the lymphocyte seems to be the first cell to appear about the egg shells. Soon after that, epithelioid and foreign body giant cells develop. The whole constitutes a microscopic nodule or pseudotubercle about the periphery of which lymphocytes, eosinophils and monocytes in variable proportions form a zone of infiltration. A peripheral layer of concentrically disposed fibroblasts next appears, and by the progressive broadening and condensation of this capsule the pseudotubercle is ultimately converted into a spherical fibrous nodule averaging 200-250 microns in diameter. The series of changes is shown in figures 4 to 6. These nodules are extremely helpful in histologic surveys of tissues in suggesting the presence of the disease, and careful examination will often disclose the faded remnants of a schistosome shell in their center. In endemic foci, minor grades of fibrosis of the portal spaces, especially when accompanied by eosinophilic infiltration, are likewise a signal for directing a careful search for pseudotubercles and ova. An easier and more certain way of establishing the presence of the disease post mortem in very light infections is to digest portions of the liver and wall of the rectum in 3 to 10 per cent sodium or potassium hydroxide, diluting with water after digestion, centrifuging and searching for the egg shells in the sediment.[12]

The presence of ova leads to progressive fibrosis of portal spaces and of the submucosa of the colon with ultimate development, if ova continue to be deposited in sufficient numbers over several years, of a portal cirrhosis and splenomegaly. As part of the cirrhosis there is portal obstruction, resulting in development of a collateral circulation, of which an important complication is the formation of esophageal varices that not infrequently give rise to fatal hemorrhage. The heightened blood pressure in the splenic vein favors the development of sclerotic changes in its wall, at times with calcification, and in a few cases thrombosis supervenes. In my material[4] ova have been found microscopically in only 0.8 per cent of spleens in cases of schistosomiasis. This leads me to believe that ova

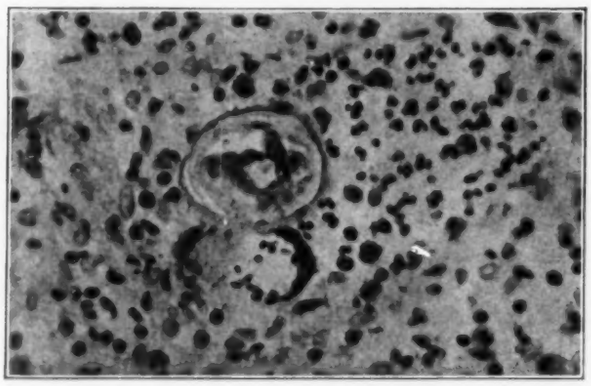


Fig. 3.—Section of human liver showing infiltration of polymorphonuclear leukocytes about ovum (× 450). Originally published in the Puerto Rico Journal of Public Health and Tropical Medicine.[4]

play no predominant part in the splenic enlargement, which is probably due to two main factors—obstruction to the portal circulation by the cirrhosis, and a general response to the infection on the part of the reticuloendothelial components of the organ.

12. Ferguson, A. R.: The Lesions of Bilharzial Disease, Glasgow M. J. **79**: 14, 1913.

In animals like the rabbit, on the other hand, we have shown the important role played by the maturing and adult schistosome worms (in contradistinction to ova), in the development of certain pathologic changes, such as polypoid endophlebitis of the intrahepatic portal branches and pulmonary arteritis. These

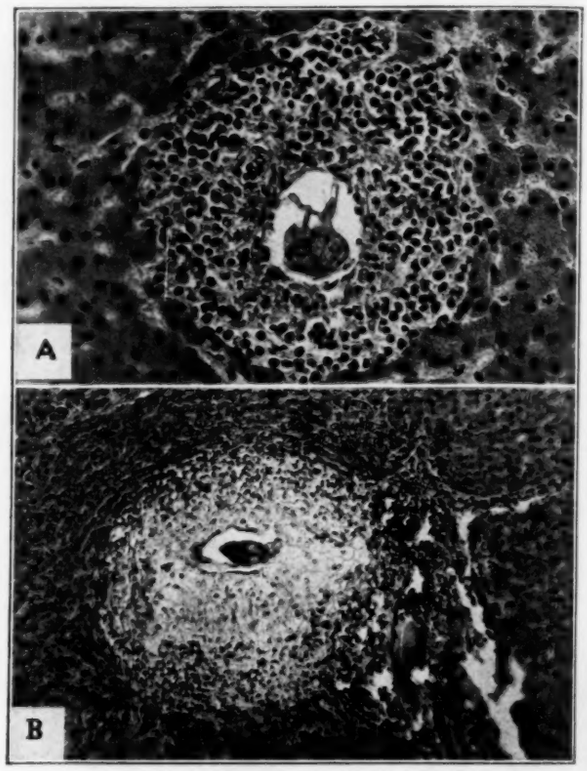


Fig. 4.—Sections of human liver: *A*, ovum in center; beginning proliferation of epithelioid cells; peripheral infiltration with eosinophils, lymphocytes and monocytes (× 240). *B*, well developed pseudotubercle with ovum in center, surrounded by epithelioid cells (× 100). Originally published in the Puerto Rico Journal of Public Health and Tropical Medicine.[4]

changes are readily demonstrable for many days before the beginning of oviposition.

Exceptional aberrant localizations of worms and ova may produce a myelitis,[13] salpingitis, oophoritis[14] or pulmonary arteritis[15] as a dominant part of the clinical or pathologic picture in man at any given time, but in the great majority of cases the fundamental pathologic triad in this disease, when fully developed, consists of colitis, portal cirrhosis and splenomegaly. Jaffé[16] of Caracas reports the finding of bilharzial myocarditis in his Venezuelan material, but I have as yet not encountered that complication in Puerto Rico, nor do I find it mentioned in the literature from Africa and the remainder of South America.

In the gastrointestinal tract, besides the colitis, fistulas to the perineum and colonic and anal polyps may develop. Ova and pseudotubercles not infrequently will be found in the appendix, and it seems as if in some cases this would give rise to symptoms referable

13. Müller, H. R., and Stender, A.: Bilharziose des Rückenmarkes unter dem Bilde einer Myelitis dorso-lumbalis transversa completa, Arch. f. Schiffs- u. Tropen.-Hyg. **34**: 527 (Oct.) 1930. Espin, J.: Mielitis producida por huevos de "Schistosoma mansoni," Rev. Policlin. Caracas **10**: 245 (July-Aug.) 1941.

14. De la Pila Iglesias, M.: Un caso quirúrgico de Schistosomiasis de las trompas de Falopio y del ovario, Memoria de la Facultad de la Clínica Quirúrgica del Dr. Pila, Ponce, P. R. **1**: 11, 1928.

15. Clark, E., and Graef, I.: Chronic Pulmonary Arteritis in Schistosomiasis Mansoni Associated with Right Ventricular Hypertrophy: Report of a Case, Am. J. Path. **11**: 693 (July) 1935.

16. Jaffé, R.: Sobre la bilharziosis en niños y jóvenes (hasta los veinte años), Rev. de la Policlínica Caracas. No. 49, December 1939.

to that organ. In other cases ova are laid in large numbers in the mesentery or mesocolon, resulting in massive fibrosis and edema of those parts with formation of a tumor-like mass which may produce intestinal obstruction; it is fortunate that such cases are rare for they are very puzzling from the diagnostic point of view and quite hopeless from the therapeutic.

CLINICOPATHOLOGIC FEATURES

The manifestations of the disease, both clinical and anatomic, may conveniently be grouped into three stages: (1) an early period comprising penetration of the cercariae, migration within blood vessels and maturation in intrahepatic portal branches, (2) an intermediate period of progressive accumulation of ova in various organs and tissues, and (3) a late period of frank visceral damage, mainly cirrhosis and splenomegaly.

Early Period.—I am not aware of any pathologic studies describing the changes in the human host prior to the onset of oviposition, so one must try to surmise what happens in man from what obtains in animals experimentally infected. In the rabbit,[6] changes are slight except in hyperinfections, in which event the animal may die prior to the onset of oviposition. Penetration produces a mild dermatitis of brief duration and an acute adenitis of the inguinal and axillary nodes, probably due to the passage of the metacercariae but conceivably also to bacteria brought in by the penetrating cercariae. As the metacercariae pass through the pulmonary circulation, some capillaries become obstructed and even ruptured. In the former case a small focus of congestion and infiltration with eosinophils and a few round cells will result. In the case of rupture, petechiae develop and are found during the period of migration in all tissues but are always more numerous in the lung. Should the migrating parasite undergo extravasation in the lung, there is formed a limited area of eosinophilic and lymphocytic infiltration with or without foreign body giant cells. During the first week of infection the rabbit's spleen reacts with congestion and pseudoeosinophilic infiltration. The liver, before the deposition of any ova, shows a portal phlebitis with round cell and eosinophilic response in the intima of these vessels and in the surrounding connective tissue; these alterations are diffuse but more pronounced about worms. Comparisons between different species are hazardous, however, and in later stages, at least, the hepatic alterations in the rabbit are rather different from those in man.

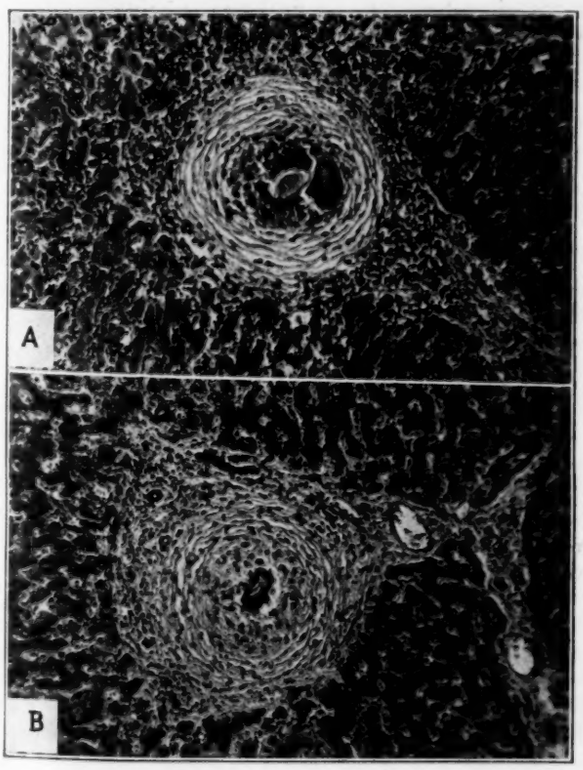


Fig. 5.—Sections of human liver: *A*, regressing pseudotubercle; well developed capsule; note large giant cells and reduction of zone of epithelioid cells (× 100). *B*, regressing pseudotubercle. Note eggshell in center (× 100). Originally published in the Puerto Rico Journal of Public Health and Tropical Medicine.[4]

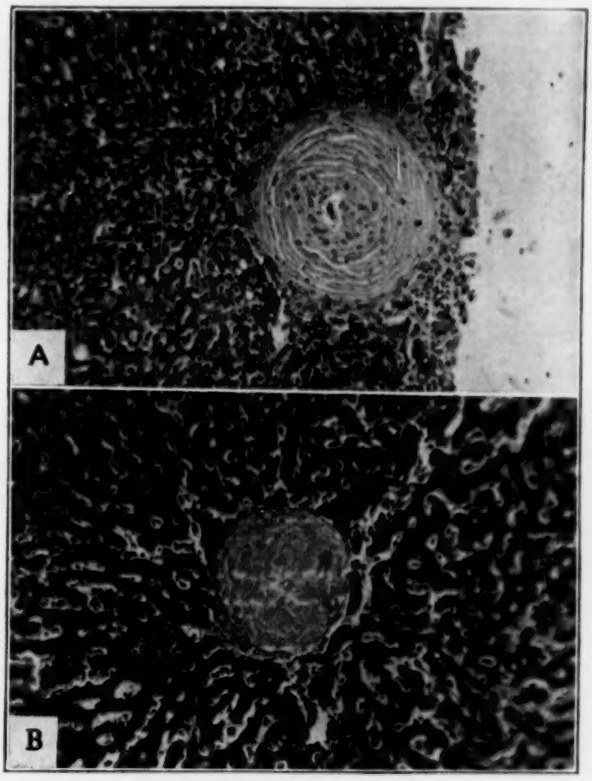


Fig. 6.—Sections of human liver: *A*, pseudotubercle almost completely fibrosed; note eggshell in center (× 100). *B*, fibrous nodule marking final stage in healing of a pseudotubercle (× 100). Originally published in the Puerto Rico Journal of Public Health and Tropical Medicine.[4]

In man this early period usually is asymptomatic, exception being made of itching for a few hours over the parts exposed to the infested water. A history of well defined itching after falling into, or bathing in, a stream should always bring to mind this disease, and if the stream is known to be infested such a history should be taken as strong presumptive evidence of infection having actually taken place. According to Pons,[17] some patients complain of anorexia, weakness, loss of weight, headache, nausea, vague intestinal symptoms, looseness of the bowels and either feverishness or short accessions of high fever. These symptoms have their onset a few days to two weeks after exposure, and not all of them may be present at a given time. Unfortunately, these manifestations have so far been

17. Pons, J. A.: Studies on Schistosomiasis Mansoni in Puerto Rico: V. Clinical Aspects of Schistosomiasis Mansoni in Puerto Rico, Puerto Rico J. Pub. Health & Trop. Med. **13**: 171 (Dec.) 1937.

studied in but few cases and, furthermore, it seems probable that they are present in the heavier infections only. Before ova begin to pass with the feces, there are no sure means of establishing the diagnosis.

Intermediate Stage.—This is taken to begin with the onset of oviposition on or about the fortieth day after exposure. By this time all predestined wandering through the body has come to an end, and the worms have reached maturity.

The first well defined symptoms of this stage, and of schistosomal infection as a whole, begin at different times, according to different authors. Pons sets the beginning at thirty-nine to forty-five days after exposure. Girges [18] at twenty-one to thirty-five and Lawton [19] at twenty-eight to eighty-four days. The symptoms have an abrupt onset with fever, accompanied or not by a chill, having a remittent or intermittent course and reaching 102 or as high as 104 F. daily. The duration is at least two or three weeks, probably longer when not cut short by treatment. The fever is accompanied by the usual symptoms of a febrile process, by generalized or localized abdominal discomfort, with or without pain, which may be colicky, by nausea, vomiting, abdominal distention, dysenteriform manifestations, urticaria and cough, which can be hacking and persistent. Physical examination may disclose patchy areas suggestive of bronchopneumonia and enlargement of the spleen and liver. There may be severe eosinophilia with a low, normal or elevated leukocytic count.

Faust, Jones and Hoffman [20] found that ova of S. mansoni begin to appear, in the stools of monkeys experimentally infected, thirty-seven to forty-two days after exposure. In the rabbit and white rat I first encountered ova in sections of the liver on the fortieth day. As Pons [17] well points out, the onset of the fever in his cases coincided quite precisely with the beginning of oviposition. From this time on large numbers of ova with their contained embryos are being deposited in the intestine and being carried to the liver. While some reach the intestinal lumen, many others are retained in the tissues; the embryo soon dies, often even while the ovum is still within a blood vessel, and the ova provoke an inflammatory reaction. The febrile period of this stage of the disease is best explained as part of the host's response to the ova and to the humoral phenomena, probably of allergic nature, incidental to the death and disintegration of large numbers of embryos. It is also highly probable that in cases in which these manifestations are present worms are passing to the lungs and giving rise to patchy areas of pneumonia.

Girges and Lawton set the onset of the febrile period at an earlier date than Pons, but this discrepancy might well be of no fundamental importance, for it is to be expected that in some cases, especially in the more heavily infected, the symptoms of the early stage may be so severe as to blend with those of the stage under discussion. The late onset given by Lawton, as up to the eighty-fourth day after exposure, is not readily explainable.

After the initial febrile period, which does not occur in all cases, the clinical course is variable. If the infection has been slight, symptoms are very mild or altogether lacking. Other patients will go through irregular periods of abdominal discomfort, of more or less severe, more or less prolonged diarrhea, often with blood in the stools. There may be further febrile accessions. The diarrhea may be accompanied by tenesmus and may alternate with periods of constipation. During times of quiescence, both the diarrhea and the abdominal discomfort or pain may be provoked by dietary excesses or indiscretions, or by the ingestion of spirituous liquors. Frequently there is nothing very characteristic about the disease during the early part of this stage, and the spleen and liver may not be palpable for a number of years after onset. However, given the geographic possibility of infection having taken place in a given case, diarrhea with blood in the stools and obscure abdominal symptoms call imperatively for inclusion of the disease in the differential diagnosis. In this stage of the disease eosinophilia is a very frequent finding and of great value in calling the observer's attention to a parasitic illness.

Not enough emphasis can be laid on the importance of establishing the diagnosis at this stage, and the earlier the better. Failure to do so and to carry on treatment will seal the patient's fate or condemn him to prolonged ill health.

During this time a chronic colitis with alternating phases of acuteness and quiescence is being established. The mucosa may show extensive superficial ulceration, and sometimes polyps or fistulas will form. The ova which are being swept from intestinal venules into the liver are caught in the portal venules and do their damage in the portal spaces. The splenic enlargement at this stage is due to congestion secondary to the portal fibrosis, and to reticuloendothelial hyperplasia.

The gravity of the symptoms and the outcome of the disease depend on how heavy the infection has been and on whether oviposition can be stopped through treatment by destroying the adult worms before the hepatic fibrosis has developed into a true cirrhosis. It is usually a matter of ten or twelve years before frank cirrhosis develops.

Late Stage.—This has been previously defined as the stage of frank visceral damage. It is obvious that, for a given case, the classification will depend on what the observer would consider frank damage. According to my conception of this disease, the main criterion in the average case of schistosomiasis should be the question of whether or not hepatic cirrhosis is already present. Aberrant localizations of ovipositing worms may at any time give rise to such frank visceral damage as oophoritis or salpingitis, but these are complications which may appear quite early in the course of the disease and, if diagnosed in time, should be amenable to treatment. The colitis itself, which may constitute a prominent part of the clinical picture from very early in the course, should not, unless grossly misdiagnosed and neglected, decide the outcome of the disease. Bilharzial pulmonary arteritis and bilharzial myelitis are grave but rare manifestations and constitute complications rather than an integral part of the natural history of the malady. The average patient with uncomplicated schistosomiasis in the late stage will as a rule succumb to hepatic cirrhosis, and it is the condition of the liver that decides the prognosis.

18. Girges, Rameses: Schistosomiasis (Bilharziasis), London, John Bale Sons and Danielsson, Ltd., 1934; The Clinical Aspects of Schistosomiasis Mansoni, Puerto Rico J. Pub. Health & Trop. Med. **13:** 171 (Dec.) 1937.

19. Lawton, F. B.: Schistosomum Mansoni: Early Clinical Features of the Disease, publication by Commonwealth of Australia Department of Defense, 1917, p. 11.

20. Faust, E. C.; Jones, C. A., and Hoffman, W. A.: Studies in Schistosomiasis Mansoni in Puerto Rico: III. Biologic Studies: 2. The Mammalian Phase of the Life Cycle, Puerto Rico J. Pub. Health & Trop. Med. **10:** 133 (Dec.) 1934.

In the late stage the clinical picture is dominated by the manifestations of cirrhosis with splenomegaly, ascites, anemia and cachexia. Diarrhea may still occur in bouts, but it may be altogether absent for long periods. Vague abdominal symptoms and pain of variable intensity referred to some part of the colon usually persist. At any time during this stage there may come accessions of fever lasting from a few days to several weeks. Eosinophilia may persist in some cases while in others it is lacking. Ova are often absent from the stools, not so much, in our opinion, because of fibrosis of the intestinal wall as because by this time the disease has lasted for many years and the number of ovipositing worms has become greatly reduced. The clinical picture may be the exact duplicate of Laënnec's cirrhosis, or it may mimic the Banti syndrome when, as not infrequently happens, there is anemia with leukopenia. Hematemesis is of frequent occurrence and may be the first indication of cirrhosis; not infrequently it is the immediate cause of death.

The diagnosis at this stage depends on the clinical history, on the presence of eosinophilia, on repeated search for ova in the stools utilizing methods of concentration and, lastly, on exploratory laparotomy with biopsy of the liver. Fairley's complement fixation [21] and cutaneous [22] tests, as well as Taliaferro's precipitin test,[23] hold great promise as aids in diagnosis. It is unfortunate, however, that since they have not yet been applied in large numbers of cases their limitations and pitfalls are not fully known.

Once cirrhosis is well developed, it is probable that the establishment of the diagnosis becames of little more than academic interest. Certainly, some symptoms like those of colitis may be very favorably influenced by judicious treatment even in the far advanced cirrhotic case, but practically no effect will be exercised on the hepatic process, which will continue to progress relentlessly even after the parasites are destroyed.

Pathologically, the cases in the late stage usually present but little evidence of acute colitis. This will depend on how active the infestation was at the time of death. If, as obtains in many cases, there had been no recent reinfestations, and ten or fifteen years had elapsed since the last one, the number of worms encountered will be small, or preponderantly of one sex, with the result that the number of ova reaching the large intestine has by this time become greatly reduced. Some fibrosis of the submucosa in the sigmoid and rectum will, however, usually be demonstrable and ova or empty egg shells, some of them calcified, will be found microscopically, mainly in the mucosa and submucosa.

The liver may be large, small or normal in size. It is always dense and pale, with a surface that is usually finely nodular and only exceptionally coarsely nodular. On section the principal characteristic is the concentration of the fibrosis about the larger portal branches. When this feature is well developed there are distinct collars of white or pink connective tissue about these veins—the so-called pipestem type of cirrhosis of Symmers.[24] Once I encountered, in a man aged 24, a greatly deformed liver with all the external appearances of a hepar lobatum. Yet in this case there was no indication that syphilis was present, so that the possibility that schistosomiasis may at times duplicate the gross external appearance of late syphilis of the liver ought to be kept in mind. Microscopically, there is diffuse scarring of portal spaces with formation of pseudotubercles about ova, diffuse and focal infiltration with lymphocytes, plasma cells and eosinophils and more or less pigmentation of Kupffer's cells and phagocytes in the periportal tissues, with finely divided brown pigment which is opaque when viewed with the compound microscope without Nicol prisms.

The spleen may not be enlarged, even when there is advanced cirrhosis, but this is exceptional, splenomegaly being the rule. The spleen in cases in the late stage is characterized by a diffuse fibrosis of the pulp which ultimately results in great reduction in the number of cells in Billroth's cords and a diminution in the size and number of lymphoid follicles. Brown pigment is usually found in the reticuloendothelial cells of the organ.

TABLE 1.—*Visceral Distribution of Ova*

Organ	Minimal		Moderately Advanced		Severe	
	Cases Examined	Number Positive	Cases Examined	Number Positive	Cases Examined	Number Positive
Liver	94	64	21	18	12	12
Rectum	57	36	12	11	6	3
Colon *	42	20	12	10	12	12
Small intestine	42	4	13	6	8	6
Lungs	94	4	21	5	11	7
Mesenteric lymph nodes	30	1	8	2	5	3
Stomach	26	0	9	0	4	1
Testis	47	0	14	0	5	1
Pancreas	83	7	20	0	11	2
Gallbladder	11	0	1	0	7	1
Spleen	92	0	21	0	12	1
Retroperitoneal tissues	1	0	0	0	2	2
Urinary bladder	17	1	4	0	0	0
Appendix	8	2	2	1	1	0
Adrenal	71	1	16	0	10	0

* Parts other than rectum.

This pigment is elaborated by the adult worms from the hemoglobin of the blood they ingest and is excreted into the portal blood. It is, therefore, taken up first, and in larger quantities, by the reticuloendothelial components of the liver and also by similar cell elements in the spleen, bone marrow and mesenteric lymph nodes. The pigment cannot be differentiated by its location, appearance under the microscope or microchemical constitution from malarial pigment. We believe that, if due caution is exercised in ruling out the presence of malaria, the presence or absence of pigment, especially in the liver, can be utilized as a valid criterion in postmortem studies as to the presence or absence of living worms and the degree of activity of the schistosomal infection at the time of death. If found, it must mean that there still were living worms within the host, but it cannot be interpreted as meaning that oviposition was still taking place, for the worms remaining in the late cases may all belong to the same sex. The only criterion for activity of oviposition is the finding of embryos within ova.

The distribution of schistosome ova in the various viscera in which they were encountered by microscopic examination in 147 cases of the disease is given in table 1, based on a table from a previous work.[4] The

21. Fairley, N. H.: A Preliminary Report on an Investigation of the Immunity Reactions in Egyptian Bilharziasis, J. Roy. Army M. Corps **32**: 243-267, 1919.

22. Fairley, N. H., and Williams, F. E.: M. J. Australia **2**: 811 (Dec. 10) 1927.

23. Taliaferro, W. H.; Hoffman, W. A., and Cook, D. H.: A Precipitin Test in Intestinal Schistosomiasis (S. Mansoni), J. Prev. Med. **2**: 395-414 (Sept.) 1928.

24. Symmers, W. St. Clair: Note on a New Form of Liver Cirrhosis Due to the Presence of the Ova of Bilharzia Haematobia, J. Path. & Bact. **9**: 237, 1904.

cases appear subdivided into three groups: minimal, moderately advanced and severe. The minimal cases had had very light infections. The moderately advanced correspond to the intermediate stage of the present classification and the severe to the late stage. The last mentioned group, however, includes 2 fairly early cases (no frank cirrhosis) of extremely heavy infection, and 1 in which death was due either to treatment with fuadin or to pulmonary bilharziasis or both. With the method used (search for ova in routine microscopic sections) the liver, colon and rectum were found to contain ova in about the same proportion in all cases. From what is known of the habits of oviposition of the worm, and to a lesser extent from actual observation of sections, it seems certain, however, that more ova are present in the large intestine in a given case than in the liver. Second, when the infection is older and heavier, ova are invariably found in both the liver and the colon and, furthermore, they appear in viscera that are not involved when the infection is lighter or of shorter duration. This is natural, for the longer the duration and the heavier the infection, the larger the number of ova that will accumulate and the greater the chances for wandering of worms or sweeping of ova by the blood stream to unusual situations.

Thus in some instances ova will be encountered in the urinary bladder, ovary, fallopian tube, uterus, testes

TABLE 2.—*Cause of Cirrhosis Found at Autopsy*

Number of consecutive autopsies		1,000
Cases with gross cirrhosis		75
Idiopathic	43 (57.3%)	
Schistosomal	26 (34.6%)	
Obstructive biliary	3 (4.0%)	
Syphilitic	2 (2.6%)	
Hanot's	1 (1.3%)	

or prostate. The known intercommunications existing between the inferior hemorrhoidal vein plexus and the various pelvic plexuses explain the possibility of such localizations. Through the inferior hemorrhoidal plexus also parasites and ova may be taken up the inferior vena cava to the right side of the heart and lungs. For the schistosomal myelitis that has been described in a few instances, the explanation is not very apparent. Müller and Stender,[12] who saw 1 case, believe that the parasites pass from the vesical to the pelvic vein plexus and thence, by way of the lumbar, azygos and hemiazygos veins, to the veins of the anterior portions of the spinal cord. Espín,[13] on the other hand, believes that in his case the parasite or parasites passed from the liver by way of the hepatic artery, celiac trunk and abdominal aorta to a lumbar artery, through which the anterior spinal artery was reached. The question must remain unanswered until additional cases afford a better opportunity for analysis. It seems to me, however, from what is known about the habits of the parasite, that prolonged sojourn in arteries other than the pulmonary is probably not possible for this parasite and that a prolonged journey against the strong arterial current seems highly improbable. From the pelvic plexuses of veins the parasites ought to be able to pass rather readily to the vast vertebral plexus,[25] from where they could reach the tissues of the spinal cord for oviposition, much as in the abdominal organs.

25. Batson, O. V.: The Role of the Vertebral Veins in Metastatic Processes, Ann. Int. Med. **16**: 38 (Jan.) 1942.

In our postmortem material the ultimate cause of death was hematemesis due to a ruptured esophageal varix in one third of the advanced fatal cases, cachexia due to cirrhosis in another third and complications in the remainder. The fatal complications were hyperinfection, partial intestinal obstruction from schistosomal fibrosis of the mesocolon, colloid adenocarcinoma of the cecum, fistula of the ascending colon with formation of a large retroperitoneal abscess, and pulmonary bilharziasis.

The importance of the role played in Puerto Rico by schistosomiasis as an etiologic factor of hepatic cirrhosis is well demonstrated by the analysis made in table 2 of consecutive autopsies performed in San Juan, which, as previously mentioned, is not an endemic focus of the disease.

It is thus seen that schistomomiasis was the cause of the cirrhosis in fully one third of the cases.

There are certain differences between the clinical picture of this disease, as I have briefly described it from what I have seen of it in Puerto Rico, and the descriptions of Manson's schistosomiasis in Egypt. I refer particularly to the relative prominence in that country of papillomatous formations, especially in the lower part of the rectum, and of symptoms of colitis without cirrhosis. In the first place, I am fairly certain that in Puerto Rico, with the exception of small groups of the population in a few endemic foci, the infection on the average is milder than in Egypt. This seems due to differences in the habits of the population and in certain socioeconomic factors between the two countries. In other words, the chances of infection and repeated reinfection with heavy doses seem to be much greater in the case of the Egyptian fellaheen than in that of the Puerto Rican jíbaro. Such being the case, one can expect intestinal manifestations to be more severe and prominent in Egypt than in Puerto Rico and the intermediate stage to be more frankly dominated by symptoms of colitis. If to this is added the greater difficulty encountered in Egypt for case finding and follow-up, because of the vastly larger numbers of the population that are infected in the Nile Delta as compared with those in Puerto Rico, one can well imagine that the number of patients who go untreated or insufficiently treated must be greater than in Puerto Rico.

COMMENT

I have endeavored in the course of this presentation to emphasize certain aspects of the disease that seem to me of considerable importance. First, my view that as regards the final outcome of the average case of Manson's schistosomiasis the all important indication is to establish the diagnosis and institute treatment before the onset of cirrhosis. Second, even though at a given time in the course of the disease the presenting symptoms may be mainly referable to some organ (colon, lung, spleen) other than the liver, ova are constantly accumulating in the latter organ and producing a fibrosis which will in time give rise to an irreversible cirrhosis. Third, schistosomiasis should be thought of whenever, in an individual who has lived or sojourned in an endemic focus of the disease, there are abdominal complaints of any kind, hepatosplenic enlargement, fever with eosinophilia, evidences of cirrhosis or a Banti syndrome. Lastly, it may require a searching history, repeated fecal examinations by methods of concentration and even exploratory laparotomy with biopsy of the liver for the presence or absence of the disease to be firmly established.

Council on Foods and Nutrition

THE ENRICHMENT OF FLOUR AND BREAD, RECOMMENDED BY THE FOOD AND NUTRITION BOARD OF THE NATIONAL RESEARCH COUNCIL, AND IN THE CASE OF FLOUR NOW RECOGNIZED OFFICIALLY BY THE FEDERAL FOOD AND DRUG ADMINISTRATION, FOLLOWS CERTAIN POLICIES WHICH PREVIOUSLY WERE ADVOCATED BY THE COUNCIL (ANNUAL MEETING OF THE COUNCIL ON FOODS AND NUTRITION, THE JOURNAL, AUG. 19, 1939, P. 680). THE COUNCIL, FOR SOME TIME COGNIZANT OF THE DISADVANTAGE IN THE LOSS TO THE DIET OF THIAMINE (VITAMIN B_1) BROUGHT ABOUT BY THE EXTENSIVE USE OF HIGHLY MILLED WHITE FLOUR, ANNOUNCED IN 1939 THAT IT WOULD REGARD WITH FAVOR THE RESTORATIVE ADDITION OF THIS AND OTHER VITAMINS TO WHITE FLOUR. IT THEREFORE HAS BEEN PLEASED TO SEE THE SUCCESSFUL APPLICATION OF THIS POLICY IN THE RAPIDLY EXTENDING USE OF ENRICHED FLOUR AND ENRICHED BREAD. LATE REPORTS INDICATE THAT NO LESS THAN 70 PER CENT OF ALL FAMILY GRADE WHITE FLOUR AND BAKER'S WHITE BREAD HAD BEEN ENRICHED BEFORE THE END OF 1942. AN ORDER OF THE RECENTLY CREATED FOOD DISTRIBUTION ADMINISTRATION REQUIRED ENRICHMENT OF ALL BAKERS' WHITE BREAD AFTER JANUARY 18, 1943.

SUBSTITUTION OF ENRICHED FOR UNENRICHED WHITE BREAD INCREASES THE THIAMINE INTAKE PROVIDED BY THE "AVERAGE" DIET OF 2,500 CALORIES FROM SOMETHING LESS THAN 0.8 TO APPROXIMATELY 1.3 MG. PER DAY (LANE, R. L.; JOHNSON, ELIZABETH, AND WILLIAMS, R. R.: J. NUTRITION **23:** 613 [JUNE] 1942). IF LIQUID SKIMMED MILK IS USED IN PLACE OF WATER IN MAKING BREAD, OR, AS HAS BECOME A COMMON BAKERS' PRACTICE, IF 6 PARTS OF DRIED SKIMMED MILK SOLIDS FOR EACH 100 PARTS OF FLOUR IS ADDED TO THE DOUGH, THE RIBOFLAVIN CONTENT OF THE RESULTING BREAD COMPLIES WITH PROPOSED STANDARDS FOR ENRICHED BREAD.

EVIDENCE OF THE NUTRITIONAL SIGNIFICANCE OF THESE SMALL ADDITIONAL DAILY INCREMENTS OF THIAMINE AND RIBOFLAVIN IS PRESENTED IN THE FOLLOWING SPECIAL ARTICLE AUTHORIZED FOR PUBLICATION BY THE COUNCIL.

FRANKLIN C. BING, Secretary.

EVALUATION OF NUTRITIVE CONTRIBUTION OF ENRICHED WHITE FLOUR

RAY D. WILLIAMS, M.D.
Fellow in Medicine

HAROLD L. MASON, PH.D.
AND

RUSSELL M. WILDER, M.D.

ROCHESTER, MINN.

The nutritive contributions of diets in which the bread component was made of enriched white flour, plain white flour and whole wheat flour respectively have been studied, with particular reference to satisfaction of human requirements for thiamine and riboflavin. We have not had experience with the analytic methods for determination of niacin—also a constituent of enriched flour—and consequently were limited to noting the presence or absence of symptoms of abnormality attributable to deficiency of niacin in deciding whether requirements for niacin were satisfied. The standard diet, when the flour used was plain white flour, provided approximately 0.22 mg. of thiamine, 0.35 mg. of riboflavin and 2.5 mg. of niacin per thousand calories. This degree of restriction of thiamine, riboflavin and niacin is probably not greater than obtains frequently in the diets of certain population groups of the United States.

METHODS OF STUDY

Women who volunteered were transferred to the nutrition division of the hospital and provided with a diet supplemented so that satisfactory tissue stores of thiamine and riboflavin and of other members of the vitamin B complex were assured. During this foreperiod the subjects received their preliminary examinations and were familiarized with the routines and procedures of the ward. After this period of preliminary observation, seven of the women were chosen for study. Selection was made on the basis of absence of significant physical or emotional defects, absence of evidence of abnormal nutrition, and willingness and ability to cooperate. Moderate supervised activity was permitted—such as housekeeping, laundering and sewing.

The standard diet was composed of foods which commonly appear on American tables. The flour in the diet of 2 subjects (1 and 2) was plain, unenriched white flour—flour 1. The diet of these subjects contained by analysis approximately 0.22 mg. of thiamine and 0.35 mg. of riboflavin per thousand calories. The flour in the diet of 3 subjects (3, 4 and 5) was the same flour which had been enriched by the addition of 2.5 mg. of thiamine, 18.0 mg. of niacin and 27.3 Gm. of nonfat milk solids [1] per pound (454 Gm.)—flour 2. The diet in which the flour was thus enriched contained by analysis approximately 0.45 mg. of thiamine and 0.45 mg. of riboflavin per thousand calories. The flour in the diet of the last two subjects (6 and 7) was a whole grain wheat flour—flour 3—which by analysis contained 2.19 mg. of thiamine and 0.66 mg. of riboflavin per pound of flour (flour 3). The diet of these subjects contained by analysis approximately 0.45 mg. of thiamine and 0.45 mg. of riboflavin per thousand calories.

The calories of the diet approximated 2,250, the carbohydrate 327 Gm., the protein 67 Gm. and the fat 75 Gm. Flour contributed about 30 per cent of the calories, and sucrose and other vitamin free constituents about 15 per cent. Caloric intake was adjusted to the requirement of the individual subject by giving fractions or multiples of the diets. By this method the ratios of thiamine to calories and of riboflavin to calories were maintained nearly constant.

No supplementary provision was made for any part of the vitamin B complex, but to assure adequacy of calcium, phosphorus, iron, ascorbic acid, vitamin A and vitamin D these nutrients were provided daily as tribasic calcium phosphate 0.6 Gm., ferrous sulfate 0.2 Gm., ascorbic acid 80.0 mg. and halibut liver oil fortified with irradiated ergosterol 0.2 Gm. (providing 10,000 U. S. P. units of vitamin A and 4,000 U. S. P. units of vitamin D).

Our methods of study of thiamine and riboflavin nutrition have been presented in earlier reports.[2] Briefly, physical and neurologic examinations, determinations of proteins, calcium and phosphorus in the serum, blood counts, determinations of pyruvic acid,[3] lactic acid [4] and dextrose [5] in the blood after oral administration of dextrose (Exton-Rose dextrose tolerance test)[6] and basal metabolic rates were made during a period of preliminary observation, again at intervals during an experimental period and finally during an after period. Electrocardiograms were taken approximately every two months. Estimates of gastrointestinal

From the Division of Biochemistry, Mayo Foundation (Dr. Mason) and the Division of Medicine, Mayo Clinic (Dr. Wilder).

1. A common practice of commercial bakers is to add 6 pounds of dry, defatted milk solids to each hundred pounds of flour. (This amount of milk provides enough riboflavin to make the riboflavin content of the mix near to that of a mix made of whole wheat flour.) Enriched bread complies with proposed standards for riboflavin content when it is made with this amount of flour containing skim milk solids.

2. Williams, R. D.; Mason, H. L., and Smith, B. F.: Induced Vitamin B_1 Deficiency in Human Subjects, Proc. Staff Meet., Mayo Clin. **14:** 787-793 (Dec. 13) 1939. Williams, R. D.; Mason, H. L.; Wilder, R. M., and Smith, B. F.: Observations on Induced Thiamine (Vitamin B_1) Deficiency in Man, Arch. Int. Med. **66:** 785-799 (Oct.) 1940. Williams, Mason, Smith and Wilder.[13]

3. Bueding, Ernest, and Wortis, Herman: Stabilization and Determination of Pyruvic Acid in the Blood, J. Biol. Chem. **133:** 585-591 (April) 1940.

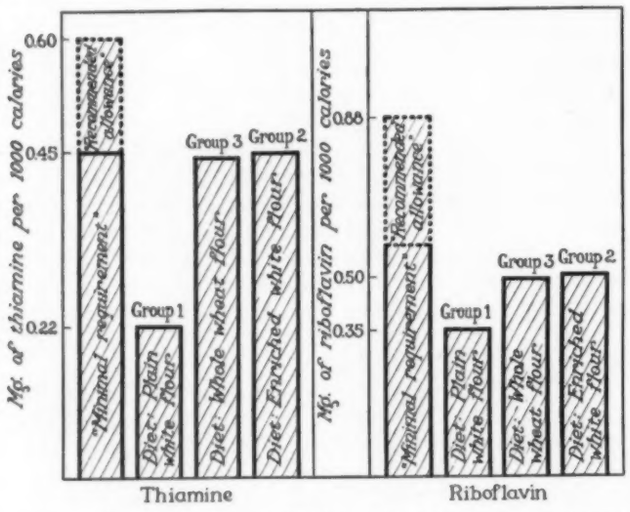
4. Barker, S. B., and Summerson, W. H.: The Colorimetric Determination of Lactic Acid in Biological Materials, J. Biol. Chem. **138:** 535-554 (April) 1941.

5. Miller, B. F., and Van Slyke, D. D.: A Direct Microtitration Method for Blood Sugar, J. Biol. Chem. **114:** 583-595 (July) 1936.

6. Exton, W. G., and Rose, A. R.: The One Hour, Two Dose Dextrose Tolerance Test, Am. J. Clin. Path. **4:** 381-399, 1934.

motility were made by taking roentgenograms a half, one, two, three and five hours after administration of a meal of barium sulfate. During determination of gastrointestinal motility the subjects were maintained in the postabsorptive state and in the sitting or standing position for the period of five hours.

Urine was analyzed for content of thiamine by the thiochrome method of Hennessy [7] and for riboflavin by the fluorometric method of Ferrebee [8] each week. An excretion of less than 100 micrograms of thiamine in twenty-four hours was considered indicative of an unsatisfactory intake of thiamine.[9] In the study here reported a test dose of 1.0 mg. of thiamine hydrochloride and 2.0 mg. of sodium riboflavin was injected subcutaneously once every month with determination of excretion for the ensuing four hours. These tests were performed with the subjects in the postabsorptive state. Excretion of less than 200 micrograms of thiamine in four hours after injection of a test dose of 1 mg. was



A comparison of intakes of thiamine and riboflavin by experimental subjects with minimal requirements (suggested by our own data) of thiamine and riboflavin and with allowances recommended by the Food and Nutrition Board of the National Research Council (dotted line).

considered indicative of depletion of tissue stores of this vitamin.[10] We are as yet not ready to make comparable evaluations for excretions of riboflavin.

OBSERVATIONS ON THE SUBJECTS RECEIVING PLAIN UNENRICHED WHITE FLOUR (SUBJECTS OF GROUP 1)

The period of maintenance on the basal diet began Sept. 12, 1941 and ended May 31, 1942 (263 days). Signs, symptoms and metabolic defects suggestive of deficiency of thiamine developed within 100 days. The deficiency syndrome was not essentially different from the syndrome of chronic, moderate restriction of thiamine which we previously have described.[11] That the signs, symptoms and metabolic defects observed were caused principally by deficiency of thiamine is indicated by the fact that they were essentially relieved by later administration, May 16 to 31, of thiamine only. Physical evidence of deficiency of riboflavin or of niacin was not detected. However, the tongue of 1 subject (1) became somewhat reddened after four months, although the subject did not complain of soreness.

OBSERVATIONS ON SUBJECTS RECEIVING ENRICHED WHITE FLOUR (SUBJECTS OF GROUP 2)

The period of maintenance on the basal diet began Sept. 12, 1941 and ended May 31, 1942 (263 days). Signs or symptoms of nutritional deficiency disease were never clearly in evidence among subjects of this group. However, in subjects 3 and 5 low excretions of thiamine for twenty-four hours and somewhat unsatisfactory excretions of test doses of thiamine were encountered. In periods when excretions were lowest, mild complaints of anorexia and weakness were voiced and the subjects occasionally were somewhat irritable and quarrelsome. Additional evidence that the intake of thiamine was not enough for entirely satisfactory nutritional status appeared from moderately abnormal elevations of pyruvic acid in the blood after administration of dextrose. That this mild abnormality was caused by deficiency of thiamine is indicated by the fact that administration of 15 mg. of thiamine hydrochloride daily in the period May 16 to May 31, 1942 was associated with its correction. The presence of mild metabolic defect, excretions of less than 100 micrograms in twenty-four hours and excretions of less than 200 micrograms in four hours after administration of a test dose of 1 mg. of thiamine constitute evidence which, as we have discussed in another paper,[10] suggests that 0.45 mg. of thiamine per thousand calories is something less than a satisfactory intake of this vitamin.

Likewise the excretions of riboflavin for twenty-four hours and for four hours after a test dose of 2 mg. of riboflavin were somewhat low, indicating some degree of depletion of tissue stores of riboflavin. However, abnormalities of the skin, the eyes and the tongue characteristic of riboflavin deficiency did not develop.

OBSERVATIONS ON SUBJECTS RECEIVING WHOLE WHEAT FLOUR (SUBJECTS OF GROUP 3)

The period of maintenance on the basal diet began Sept. 12, 1941 and ended May 31, 1942 (263 days). One subject (6) complained of weakness and mild loss of appetite after 100 days. These conditions were associated with some reduction of activity. At about this time excretions of thiamine fell to less than 100 micrograms in twenty-four hours and excretions after the test dose of thiamine fell to less than 200 micrograms. At about the two hundredth day this subject complained of numbness and tingling of the medial surfaces of the legs. The condition did not progress during the ensuing sixty days. That the complaints had basis in biochemical defect is indicated by values for pyruvic acid in the blood after administration of dextrose. The biochemical defect was corrected when 15 mg. of thiamine hydrochloride daily was provided in the period May 16 to May 31, 1942.

The nutritional status of the second subject of this group (7) continued better throughout the period of study than that of the other subject of this group, and also better than that of subjects of group 2. The ordinary excretions of thiamine and riboflavin were higher and excretions after test doses of thiamine and riboflavin indicated that depletion of tissue stores of thiamine and of riboflavin was minimal. Possible

7. Hennessy, D. J.: Chemical Methods for Determination of Vitamin B_1, Indust. & Engin. Chem. (Analyt. Ed.) **13**: 216-218 (April 15) 1941.

8. Ferrebee, J. W.: The Urinary Excretion of Riboflavin: Fluorometric Method for Its Estimation, J. Clin. Investigation **19**: 251-256 (Jan.) 1940.

9. Mason, H. L., and Williams, R. D.: The Urinary Excretion of Thiamine as an Index of the Nutritional Level: Assessment of the Value of a Test Dose, J. Clin. Investigation **21**: 247-255 (March) 1942.

10. Williams, R. D.; Mason, H. L., and Wilder, R. M.: The Minimum Daily Requirement of Thiamine of Man, J. Nutrition **25**: 71-97 (Jan. 11) 1943.

11. Williams, R. D.; Mason, H. L.; Smith, B. F., and Wilder, R. M.: Induced Thiamine (Vitamin B_1) Deficiency and the Thiamine Requirement of Man: Further Observations, Arch. Int. Med. **69**: 721-738 (May) 1942.

explanations are better initial stores of thiamine and riboflavin, lower requirements for them or better utilization of ingested vitamins. This subject was the youngest and most robust of the subjects of all three groups.

COMMENT AND SUMMARY

Adult human subjects were maintained for a period of nearly nine months (263 days) on a diet which contained 170 Gm. (6 ounces) of ordinary white flour, which provided approximately 0.2 mg. of thiamine and 0.35 mg. of riboflavin per thousand calories. It was constructed of foods which commonly appear on American tables. Every subject received each day lean beef 100 Gm. or beef 75 Gm. and cottage cheese 35 Gm., canned carrots or beets or corn 50 to 75 Gm., lettuce or celery 30 Gm., tomatoes 75 Gm. or lemon juice 20 Gm., canned pineapple 80 Gm. or applesauce 100 Gm. or dried sulfured apricots 30 Gm., butter 45 Gm., cream (35 per cent butterfat) 75 Gm., flour used in bread, cake or for other purposes 170 Gm. and sugar as such or used in cake, jelly or candy 100 Gm. The calories closely approximated 2,250, the carbohydrates 327 Gm., the protein 67 Gm. and the fat 75 Gm. The flour contributed about 30 per cent of the calories, and the sugar and other vitamin free constituents about 15 per cent. Thiamine deficiency disease developed, evidenced by clinical signs and symptoms, low excretions of thiamine and abnormal elevations of pyruvic acid in the blood after oral administration of dextrose.

Other subjects maintained on a regimen which was identical in every respect to the diet described, with the exception that the quota of flour was an enriched flour, to which furthermore 6 parts of skim milk solids was added for each 100 parts of flour—a common bakers' practice—maintained a nutritional status which was reasonably satisfactory. Signs, symptoms and metabolic defects suggestive of thiamine deficiency of an exceedingly mild degree were, however, observed. These subjects, as far as could be determined, at the end of the period of study were in as good a physical status as the subjects of a third group who received the same diet, with the exception that the quota of flour was a whole grain flour.

The clinical courses, the excretions of thiamine and riboflavin and the apparent biochemical status of subjects who received either the flour with thiamine, niacin and nonfat milk solids added or the whole grain flour were very much better than the courses and status of the subjects who received the ordinary white flour.

The conclusion seems to be fully justified that a flour which contains, as a minimum, 2.0 mg. of thiamine and 15.0 mg. of niacin per pound (454 Gm.) with 6 parts per hundred of nonfat milk solids is nutritionally a satisfactory food.

A further comment appears justified. Estimates based on disappearance of flour in the United States, exclusive of exported flour, indicate that the average per capita consumption of flour daily approximates 6.5 ounces (185 Gm.) and that this contributes about 25 per cent of the calories of the average diet. Similar estimates based on disappearance of sugar indicate that the consumption of sugar per capita daily approximates 3 ounces (85 Gm.) and that sugar thus contributes from 13 to 17 per cent of the calories of the average diet. In the diets used in the experiments here reported, the contribution of flour, sugar and other vitamin free constituents to the total calories approximated 30, 10 and 5 per cent respectively. From these estimates and from the experimental results it would appear that the average American diet, when its flour quota is plain, unenriched white flour, provides an insufficient amount of thiamine except when its foods other than its content of flour and sugar are selected with greater care than probably is customary. Restorative enrichment of white flour with thiamine to whole wheat levels helps greatly to correct this defect, whereas comparable enrichment with riboflavin, namely to whole wheat levels, will not correct the deficiency of the average diet in riboflavin (as shown in the accompanying chart). Our experiment was not designed to provide similar information about nicotinic acid (niacin).

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

OVARIES (See New and Nonofficial Remedies, 1942, p. 373).

The following dosage form has been accepted:

THE LAKESIDE LABORATORIES, INC., MILWAUKEE.

Solution of Estrogens (in oil): 10 cc. rubber stoppered vials. Each cubic centimeter contains the equivalent of 20,000 international units of estrone and 0.5 per cent of chlorobutanol as a preservative in sesame oil.

NIKETHAMIDE (See the Supplement to New and Nonofficial Remedies, 1942, p. 17).

The following dosage form has been accepted:

THE LAKESIDE LABORATORIES, INC., MILWAUKEE.

Ampul Solution of Nikethamide 25% W/V: 1½ cc. 0.5 per cent chlorobutanol added as a preservative.

PYRIDOXINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1942, p. 563).

The following dosage forms have been accepted:

THE UPJOHN COMPANY, KALAMAZOO, MICH.

Tablets Pyridoxine Hydrochloride: 10 mg.

Ampoules Sterile Solution Pyridoxine Hydrochloride: 50 mg. in 2 cc.

JOHN WYETH & BROTHER, INC., PHILADELPHIA.

Tablets Pyridoxine Hydrochloride: 25 mg.

Ampoules Solution Pyridoxine Hydrochloride: 50 mg. in 1 cc.

RIBOFLAVIN (See New and Nonofficial Remedies, 1942, p. 559).

The following dosage forms have been accepted:

THE WALKER VITAMIN PRODUCTS, INC., MOUNT VERNON, N. Y.

Tablets Riboflavin: 1 mg. and 5 mg.

SODIUM MORRHUATE (See New and Nonofficial Remedies, 1942, p. 290).

The following dosage forms have been accepted:

GEORGE A. BREON & COMPANY, INC., KANSAS CITY, MO.

Solution of Sodium Morrhuate 5% with Benzyl Alcohol 2%: 5 cc. vials. Each cubic centimeter contains sodium morrhuate 0.05 Gm. (¾ grain) and benzyl alcohol 0.02 Gm. (⅓ grain) in aqueous solution.

BURROUGHS WELLCOME & CO., INC., NEW YORK.

Hypoloid (Ampoule Solution) Sodium Morrhuate 5%, 2 cc.: Each cubic centimeter contains sodium morrhuate 0.05 Gm. and 0.5 per cent of phenol as a preservative.

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SATURDAY, MARCH 20, 1943

THE SAFETY OF POOLED HUMAN PLASMA

In a discussion of the toxicity of human plasma a few months ago,[1] THE JOURNAL called attention to the results of observations on the intravenous injection of unpooled plasma by Levine and State.[2] Their work dealt with unpooled or monovalent plasma; the conclusion that there is "a correlation between skin sensitivity to the plasma and reactions after plasma transfusions" is not applicable therefore to pooled plasma. The authors themselves state that "it is not known what pooling of plasmas will do toward the elimination of transfusion reactions."

In the meantime the excellent results in the clinical use, without preliminary tests, of plasma indicate that pooling under standard requirements, perhaps by mere dilution, inactivates substances—antigens, haptens, antibodies—that may be present in individual samples of plasma. Possibly also the introduction from without of harmful substances is prevented by the method of preparing pooled plasma. It should not be overlooked that general reactions may follow almost any kind of intravenous injection, e. g. saline solution of dextrose, owing perhaps to the presence of nonspecific, pyrogenic substances. Polayes and Squillace[3] attributed chill and shock in a woman with postpartum hemorrhage to the intravenous injection of a solution of dried human plasma. While it is not absolutely certain that the plasma used was or was not pooled, account was not taken of the injection of 1,000 cc. of 10 per cent dextrose in saline solution shortly before the plasma was given. The conclusion that the reaction was due to plasma is open to challenge because it may have been caused by the dextrose solution.

From a careful analysis of extensive data, Thalhimer[4] concludes that in pools of plasma or serum, agglutinins are reduced to such a low level "that no danger can result to patients from the injection of even large doses of these pools." Large amounts of pooled plasma are given safely without any preliminary tests for compatibility. The demonstration of the surpassing value of pooled human plasma in shock has been designated "a major medical victory."

PROPAMIDINE IN CHRONIC WOUND INFECTION

A series of aromatic diamidines prepared by Ewins was found by Lourie and Yorke[1] to possess activity against protozoal organisms as well as antimicrobic action. From the consideration of the chemical structure of these compounds it was expected that their antibacterial effect would not be inhibited by p-aminobenzoic acid as is the case with the sulfonamides. Thrower and Valentine[2] point out that sulfathiazole in a minimal concentration of 1:32,000 exerted an antibacterial effect and that this effect was completely inhibited by the addition of 1:10,000 to 1:1,000,000 of p-aminobenzoic acid. Propamidine, however, was unaffected by the p-aminobenzoic acid in the same dilutions and exerted an antibacterial effect at the minimal effective concentration of 1:128,000 in both cases.

In vitro experiments indicated that 4:4′ diamidinodiphenoxypropane dihydrochloride (propamidine) possesses a bacteriostatic activity against Staphylococcus aureus of the same order as sulfathiazole. The bactericidal activity of this drug appears to be equal to its bacteriostatic activity. Effective concentrations of this substance did not inhibit phagocytosis or cause hemolysis, and the bactericidal effect was not seriously lessened by the presence of pus. Clinical application of propamidine in 50 cases demonstrated that a concentration of 0.1 per cent of the drug in a 4.5 to 5 per cent strength of a watery methyl cellulose jell will clear an infected area of dangerous organisms within ten days. Long application may lead to a mild superficial necrosis and to a relapse in the bacteriologic picture. The general efficacy of the preparation was demonstrated by the rapid improvement noted in all the cases. The wounds treated had often remained infected for months—sometimes for more than a year. The regular response to the application of the jelly could not have been due to chance.

McIndoe and Tilley[3] report 11 cases of persistent hemolytic streptococcus infection in which other methods had failed and in which 0.1 per cent propamidine

1. Toxicity of Human Plasma, editorial, J. A. M. A. **120:** 206 (Sept. 19) 1942.
2. Levine, Milton, and State, David: Skin Sensitivity to Human Plasma, Science **96:** 68 (July 17) 1942; A and B Substances as a Cause of Reactions Following Human Plasma Transfusions, J. A. M. A. **120:** 275 (Sept. 26) 1942.
3. Polayes, S. H., and Squillace, J. A.: Near Fatal Reaction to Transfusion with Dried Human Plasma Solution, J. A. M. A. **118:** 1050 (March 28) 1942.
4. Thalhimer, William: Intravenous Injections of Pooled Normal Plasma or Serum, J. A. M. A. **120:** 1262 (Dec. 19) 1942.

1. Lourie, E. M., and Yorke, Warrington: Studies in Chemotherapy—The Trypanocidal Action of Certain Aromatic Diamidines, Ann. Trop. Med. **33:** 289 (Dec. 30) 1939.
2. Thrower, W. R., and Valentine, F. C. O.: Propamidine in Chronic Wound Sepsis, Lancet **1:** 133 (Jan. 30) 1943.
3. McIndoe, A. H., and Tilley, A. R.: Propamidine in Chronic Streptococcal Infection of Raw Surfaces, Lancet **1:** 136 (Jan. 30) 1943.

in a water soluble jelly base controlled the infection within four to ten days. Cases with persistent streptococcic infection in wounds constitute a constant danger in an open ward from the point of view of cross infection. Elimination of the responsible organism, therefore, is of the highest importance. The new drug seems to offer the possibility of eliminating this danger and should therefore be useful in a plastic unit.

Morley and Bentley [4] report encouraging results with propamidine in a small number of cases of burns. They suggest that the drug applied as 0.1 per cent propamidine with 1 per cent amylocaine hydrochloride in a Mumford base (a lanette wax) may prove an ideal first aid preparation in burns. Almost all their cases have shown on culture a profuse growth of Proteus vulgaris and Pseudomonas aeruginosa and diphtheroids. These growths have been so profuse that they may have obscured any streptococci and any other organisms present. However, absence of systemic reaction and speedy healing of the burned areas without relapse suggest that streptococcic and staphylococcic infection is effectively controlled. Before grafting is to be contemplated it is necessary, after a period of treatment with propamidine, to eradicate Proteus vulgaris and Pseudomonas aeruginosa, which are both pus producers.

Kohn, Hall and Cross [5] treated 8 cases of infected wounds and found that Thiersch and pedicle grafting was made possible much earlier with the use of propamidine than with any other method they had used before.

The investigations here summarized seem to indicate that the therapeutic armamentarium against infected wounds is now extended by a product with some virtues not evident in the sulfonamides. Obviously more extended studies are needed to determine under well controlled conditions its relative advantages and limitations. Sulfonamides, penicillin, gramicidin and now propamidine constitute a remarkable list of products useful against infection.

NEW YORK PRESCRIBES STANDARDS TO SAFEGUARD USE OF HUMAN BLOOD PRODUCTS FOR TRANSFUSION

Requirements have been prescribed by the Public Health Council of the State of New York, effective March 1, governing the methods of preparation, distribution and use of human whole blood, human plasma, human serum and other human blood derivatives for transfusion purposes. These requirements, having the effect of law in all areas of the state except New York City, represent, it is believed, the first regulatory action taken by a state body in a field that is growing rapidly in importance not only in relation to war needs but to civilian emergencies as well. In the Boston night club disaster 1,000 units of plasma was used, representing 300,000 cc. of human blood.

The new regulations provide that all laboratory tests required as an aid in determining that blood donors are free from communicable disease, including malaria and syphilis, and tests for sterility required to determine that the blood plasma, serum or any derivative is suitable for purposes of transfusion must be made in an approved laboratory. Blood processing laboratories and hospitals must submit to the commissioner of health statements of processing procedures and must keep accurate and complete records. A circular giving detailed instructions for the use of the product must accompany each final container, copies of which are required to be filed with the state health commissioner. Each package must be labeled with the dosage, unit value in standard units and the expiration date. Premises, equipment, procedures, records and circulars of instruction must be open to inspection by the state commissioner of health or his authorized representative.

Complete and accurate records must be kept of transfusions by the institutions in which they are performed, the details of which, all set up in the new regulations, vary according to the substance used, whether human blood, human plasma, human serum or other derivatives. If unstored human blood is used, for instance, certification from a physician licensed in New York must be recorded showing that a physical examination of the donor was made within the preceding thirty days, that the donor is free from communicable disease, including malaria and upper respiratory infection, and that the blood of the donor has a hemoglobin content of at least 11 Gm. per hundred cubic centimeters of blood. The results of serologic tests for syphilis and of tests to determine the blood group to which both the recipient and the donor belong must be recorded. If human blood plasma, human serum or other derivatives are used for transfusion the records must show the kind of product used, the name and address of the producing laboratory or hospital, the specimen or lot number or other identification of the product and its expiration date.

These new requirements were prescribed after careful and deliberate study by the New York Public Health Council and after a critical review by representatives of several hospitals, the National Institute of Health, the Office of Civilian Defense, the Medical Society of the State of New York and other interested agencies. They follow realization of the possible dangers incident to the use of improperly prepared or stored human blood products for transfusion. This initial effort by a state agency to safeguard a procedure that may be vital in the preservation of human life is commendable.

4. Morley, G. H., and Bentley, J. P.: Propamidine in Burns, Lancet **1**: 138 (Jan. 30) 1943.
5. Kohn, F.; Hall, M. H., and Cross, Clara D.: Propamidine at an Ems Hospital, Lancet **1**: 140 (Jan. 30) 1943.

Current Comment

SELECTIVE SERVICE PHYSICAL EXAMINATIONS

From the Selective Service System, March 1, has come a new circular to guide physicians and dentists in the preliminary physical examination of registrants. Most of this circular appears under the heading of Medicine and the War in this issue of THE JOURNAL. The character of the Selective Service physical examination was changed from a complete medical examination to a preliminary "streamlined" physical examination to hasten the actions of the local boards and to compensate to some extent for the shortage of physicians. Moreover, final authority for physical examination rests with the armed forces; it has seemed undesirable to submit the selectee to two complete duplicate physical examinations. The circular emphasizes that an actual inspection of the selectee must be made. Unfortunately some local draft boards have not even examined men in the nude or in action so that boys with only one leg, with draining fistulas or with severe deformities of the spine were sent to induction stations. When the requirements for teeth were changed, some local examiners neglected to inspect the mouth of the selectee. The circular points out that inspection of the oral cavity is still an integral part of the examination and severe dental defects should be sufficient to disqualify the registrant for military service. Finally, the circular emphasizes that the examination must be given by a physician and cannot be delegated to any one less qualified. The details of the examination, as published elsewhere in this issue, should be most carefully studied by every physician whether or not now associated with the Selective Service System. Future developments may require his participation; in some instances he may be called for advice either by the selectee or by others concerned with the decisions of the local board.

CURRENT MORTALITY ANALYSIS

The increased importance at this time of information on public health conditions stimulated the Bureau of the Census to revise its procedure. Certain statistics of national mortality are made available many months in advance of the time formerly possible. This information will be published under the heading "Current Mortality Analysis" and will appear each month approximately seven weeks after the close of the month in which the deaths occur. The first issue, which is concerned with the mortality analysis during the fall months of 1942, has just appeared. During the autumn and early winter of 1942, this report states, surprisingly good health conditions prevailed in the United States. "Current Mortality Analysis" is especially designed for a limited distribution among persons whose work demands that they observe public health trends in the United States during the war. Those making request to the Bureau of the Census may receive this publication without cost.

BULK ETHER

THE JOURNAL and the Council on Pharmacy and Chemistry have commented previously on the use of bulk ether.[1] These are times when restrictions and savings have a special significance. The use of bulk ether may be a contribution to conservation in the war effort. The U. S. Pharmacopeia XII states that "ether to be used for anesthesia must be preserved in tight containers of not more than 3 Kg. capacity." Therefore it would be illegal to ship ether labeled For Anesthesia in containers which hold more than this amount. The Food and Drug Administration feels that the caution statement in U. S. P. XII is applicable to such ether as is "to be used for anesthesia, not to all ether. Accordingly, all ether intended for anesthesia is to be packed in containers of not greater capacity than 3 Kg.; all other ether also is required to be packaged in such containers except that it may be shipped in bulk from manufacturers or wholesale distributors when intended for manufacturing or for subsequent repackaging by the dispenser or retail distributor." Under the circumstances, manufacturers or distributors of ether shipped in bulk for purposes other than anesthesia may avoid possible misunderstanding by labeling such ether "Ether Not for Anesthesia" or, if desired, "Ether U. S. P. Not for Anesthesia." U. S. P. XII ether may therefore be shipped in any size container provided it is appropriately labeled.

COLOR BLINDNESS

Newspaper publicity given recently to an alleged cure for color blindness seems to emanate from one J. H. Lepper, optometrist, of Mason City, Iowa. In reply to inquiries concerning his procedure for correcting color blindness, a form letter is sent in which it is stated "YES, YOUR CASE OF COLOR BLINDNESS CAN BE CORRECTED. IF WE DO NOT, IT WILL BE THE FIRST CASE." The statement also suggests that cases take from two to three weeks for correction. If the patient comes to Mason City, $5 a day is charged. If the prospect finds it impossible to come to Mason City, Lepper says he can send the same equipment, involving two pairs of special colored glasses and one color vision test book, for a total of $25. A lamp with a reflector and a 60 watt bulb and a flasher if obtainable are also required for home treatment. The form letter is accompanied by a list of testimonials, none of them signed by the writer's full name. Color blindness is a congenital defect. Despite unsubstantiated claims to the contrary, methods of correcting this condition are unknown. Many letters sent to the headquarters of the American Medical Association indicate that men who have had difficulty in gaining entrance to the navy or the air force have been given false hopes by this wholly unwarranted publicity for an unestablished procedure.

1. Gold, Harry: The Use of Bulk Ether in Anesthesia, J. A. M. A. **120**: 44 (Sept. 5) 1942.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war and such other information and announcements as will be useful to the medical profession.

SELECTIVE SERVICE SYSTEM

GUIDE TO PHYSICAL EXAMINATION OF REGISTRANTS (MEDICAL CIRCULAR NO. 3)

March 1, 1943.

The purpose of this circular is to guide physicians and dentists in the preliminary physical examination of registrants to the end that all selectees will be physically examined and processed locally in like manner. The following pages furnish the reasons for the adoption of the present system of examination by Selective Service, the instructions covering the preliminary physical examination, section 623.33 (revised) of the regulations, and revised List of Defects (DSS Form 220). It is hoped that each examining physician and dentist will study carefully his personal copy of the circular—familiarize himself thoroughly with the details of the examination, as well as with the lists, and then adhere rigidly to the regulations. The objective is to disqualify all registrants locally who have manifestly disqualifying defects and forward all qualified registrants to the examining and induction station.

This Medical Circular No. 3 affords the welcomed opportunity to express to the examining physicians and dentists of the Selective Service System the appreciation of this headquarters for their loyal and valuable professional service which has proved of the utmost importance in helping the nation to meet its wartime needs.

LEWIS B. HERSHEY, Director.

MEDICAL CIRCULAR NO. 3
PRELIMINARY
PHYSICAL EXAMINATION

NATIONAL HEADQUARTERS
SELECTIVE SERVICE SYSTEM
WASHINGTON, D. C.
FEB. 15, 1943

The purpose of the Selective Service physical examination of registrants is to dispose of locally and classify into IV-F all registrants manifestly unfit for military service, thereby saving the time of such unfit registrants, the expense incident to travel and the time of the physicians and dentists at the joint induction stations.

The character of the Selective Service physical examination was changed from a complete medical examination to a preliminary physical examination because of the great increase in manpower needed by the armed forces, because of accruing shortage of physicians, and because final authority for physical examination is vested with the armed forces. Now additional demands are being placed on local boards and examining physicians through the discontinuance of recruitment. Executive Order No. 9279, dated Dec. 5, 1942, and LBM No. 178 route through Selective Service channels all men between 18 and 38 years of age who enter the armed forces.

It seems timely to call attention to the present regulations dealing with the character of the examination and to the occasional mistakes on the part of the local board examining physicians which have been due largely to failure to adhere strictly to the regulations. In some instances registrants have been forwarded to recruiting and induction stations with only one leg, with a draining urinary fistula or with deformities of advanced Pott's disease.

Several of these cases were photographed and the pictures forwarded to the War Department constituting incontrovertible evidence that Selective Service Regulations were not followed in these instances and that the registrants had not been examined in the nude and in action. The preliminary physical examination will not be effective unless the registrant is examined in the nude (stripped of all clothing), as prescribed, and unless the regulations which apply to the physical examination are rigidly followed (sec. 623.33).

Inspection of the oral cavity is still an integral part of the physical examination. Its purpose is to disclose dento-oral defects which would manifestly disqualify a registrant for military or naval service, as specified in DSS Form 220. As a matter of clinical and statistical interest as to whether or not the registrant is acceptable, the examining physician or dentist should record any unusual anomalies or any pathologic lesions observed during the examination.

The preliminary physical examination as outlined in the Selective Service Regulations should be given only by a physician. Unfortunately, some have erroneously contended that, because it consists solely of inspection, this examination may be given just as effectively by a lay member of the local board and that it does not call for the professional judgment of a physician. This attitude, no doubt, is partially responsible for the mistakes that have been committed. However, it should be obvious that only a physician is capable of understanding the medical terminology involved in DSS Form 220; that only a physician can supply the professional judgment called for in DSS Form 220; and that only a physician, through a careful and rigid inspection, is capable of determining the existence of many of the physical defects, deficiencies, disorders and diseases listed in DSS Form 220.

The very adoption of this preliminary physical examination reflects the great confidence of Selective Service in its examining physicians. Enthusiastic acceptance by the examining physicians is essential to the success of this program—enthusiasm such as is reflected in the following excerpt from a letter of one of our Selective Service examining physicians, who writes the following:

"Many of the examining physicians who are members of my Board of Examining Physicians . . . and who have in their practice of modern, streamlined medicine allowed the 'inspection' phase of physical examination to be supplanted by the x-ray and other laboratory diagnostic measures, are beginning to develop their skill of diagnosing defects . . . by an ever improving inspection ability. My examining physicians, participating in this present screening type of physical examination, have become enthusiastic in playing the game of 'spotting' pathology. Examining physicians who are really interested in this type of examination owe a debt for the privilege of participating in this refresher course which is making them more alert and is developing their senses of sight, hearing and touch in the detection of physical defects."

To meet the present needs, Selective Service has revised the regulations pertaining to this preliminary physical examination and the List of Defects. In addition, Selective Service has listed in DSS Form 220 those defects, deficiencies, disorders and diseases which, though not manifest in character, do nevertheless disqualify registrants, if properly certified by affidavit filed as prescribed in section 623.33 of the Selective Service Regulations. However, the character of the physical examination remains unchanged.

The three requisites to complete success of this preliminary physical examination are:

1. Enthusiastic acceptance of the program.
2. Thorough familiarity with the revised regulations, section 623.33, and with the revised List of Defects (DSS form 220).
3. Strict adherence to the regulations.

Section 623.33—Selective Service Regulations

Physical examination by examining physician.—(*a*) The director of Selective Service, from time to time, will issue a list of defects (form 220), which will set forth defects which manifestly disqualify the registrant for military service.

(*b*) A registrant shall personally appear before the examining physician and shall be examined in the manner provided in paragraph *c* of this section except when the examining physician or the local board is convinced that the appearance of the registrant for physical examination before the examining physician will be injurious to the registrant's health or the health of those who might be brought in contact with him. When the registrant appears before the examining physician, his physical examination should be held in a well lighted, well heated place. It should be held while the registrant is in the nude.

(*c*) The physical examination should consist of observing the registrant while walking toward, standing before and walking away from the examining physician. The registrant may be required to go through calisthenics to determine the mobility of joints or to furnish a basis for determination of his alertness, intelligence, understanding of commands, postural tensions, tendencies to incoordination and tremors. If peculiarities are noted, simple questions should be asked in an effort to bring out replies bearing on the mental health and personality characteristics of the registrant. The examining dentist or, if he is not available, the examining physician will examine the mouth of the registrant. The examining physician will take blood from the registrant for a serologic test. The blood specimen will be collected in a container furnished by the state health officer and will be forwarded to the state laboratory or other laboratory designated by the state director of Selective Service, together with the accomplished form prescribed within the state for such purpose. If the report on the first serologic test of the registrant is other than truly negative, the examining physician shall take additional blood for further serologic tests until he is satisfied that the blood is truly negative, truly doubtful or truly positive. Additional blood for further serologic tests will not be taken if distance or circumstances over which the local board or the registrant has no control make it impracticable for additional tests to be taken. Serologic tests will be accomplished without expense to the Selective Service System, unless such expense is specifically authorized by the director of Selective Service. No other laboratory procedures will be undertaken as a part of this physical examination.

(*d*) Local boards, with the assistance of the examining physician and such agencies as may be designated by the state director of Selective Service, should seek from any source possible information bearing on a history of mental disease in the family of the registrant or social maladjustment, poor work record, other mental or personality disorders of the registrant or any physical condition which might cause the armed forces ultimately to reject the registrant. This information may be secured from local social agencies, school systems, state hospitals, training schools for defectives and any other sources. The local board shall submit lists of registrants whose physical qualifications are being considered to such agencies as the director of Selective Service or state director of Selective Service may specify to assist in securing this information. The examining physician shall review the information thus received, and the local board shall forward this information or an abstract thereof to the induction station in accordance with arrangements mutually agreeable to the state director of Selective Service and the induction station for the transmittal of such information. When such information is being forwarded, a notation to that effect will be entered under "Remarks," item 25 of the Report of Physical Examination and Induction (form 221).

(*e*) The examining physician may report to the local board that a registrant is suffering from a condition listed in the List of Defects (form 220), basing his report on one or more of the following: (1) the physical examination of the registrant while he is before him; (2) his personal professional knowledge of the registrant's physical condition; (3) an acceptable affidavit from a reputable physician to the effect that such physician has personal professional knowledge of the registrant's physical condition, provided such affidavit is filed with the local board; or (4) an official statement from a government or state agency concerning the physical condition of the registrant (including a statement concerning a registrant who has been cared for in St. Elizabeths Hospital, Washington, D. C., or in a Veterans' Administration facility), provided such statement is filed with the local board.

(*f*) The examining physician shall procure from the registrant the necessary information and shall complete items 22 and 23 of the Report of Physical Examination and Induction (form 221).

(*g*) The examining physician shall enter in item 24 on the Report of Physical Examination and Induction (form 221) the result of the serologic tests as "Truly Negative," "Truly Doubtful" or "Truly Positive."

(*h*) The examining physician will enter in item 25 on the Report of Physical Examination and Induction (form 221) any pertinent remarks which he deems advisable for the benefit of the examiners at the induction station.

(*i*) The examining physician, in item 26 on the Report of Physical Examination and Induction (form 221), shall complete the answer to the following question:

> Do you find that the above named registrant has any of the defects set forth in the List of Defects (form 220)?

If the examining physician's answer is "Yes," he shall describe the defects in order of their significance. If the examining physician entertains a doubt as to whether he should answer "Yes" or "No," his answer shall be "No." No other information should be included under item 26.

NATIONAL HEADQUARTERS,
SELECTIVE SERVICE SYSTEM,
WASHINGTON, D. C.
Jan. 16, 1943.

List of Defects

Registrants having any of the following physical defects are disqualified for service in any branch of the armed forces and shall be classified in class IV-F.

ALPHABETICAL LIST

Abscess of the lung.
Achondroplasia.
Acromegaly or gigantism if markedly disfiguring or if associated with other symptoms of severe pituitary dysfunction.
Actinomycosis.
Acute rheumatic fever.
Adhesions of the lids to each other or to the eyeball.
Albino.
Amputation of an arm or leg, or complete or partial loss of a hand or a foot.
Amputation of the penis, if the resulting stump is insufficient to permit normal function of micturition.
Anus, fistula of.
Anus, paralysis of the sphincter of.
Aphonia.
Alopecia universalis.
Arch, transverse of foot, obliteration of, associated with permanent flexion of the small toes (claw toes) or with symptoms.

Arm, amputation of.
Arthritis, chronic, with deformity, disabling or with symptoms.
Asthma, chronic.
Atresia of one or both external auditory canals.
Atrophic rhinitis, chronic, with offensive odor (ozena).
Atrophies, and dystrophies, muscular, which are obviously disqualifying.
Auditory canals, external, atresia of one or both.
Blindness, total.
Bone, diseases or deformities of, which seriously interfere with the weight bearing function, with the full use of the limbs or which would prevent the performance of full duty as members of the armed forces.
Bone, tuberculosis of.
Brain, disease of.
Breathlessness, in circulatory failure.
Bronchitis, chronic, with emphysema.

Canals, auditory, external, atresia of one or both.
Carcinoma or other malignant disease of any organ or part of the body.
Cardiovascular syphilis.
Cerebrospinal syphilis.
Chest wall, tuberculosis of.
Chronic pemphigus.
Circulatory failure, evidenced by definite symptoms such as a combination of breathlessness, cyanosis and edema.
Cleft palate, with or without prosthetic appliance.
Clubfoot, if marked in degree or which interferes with the wearing of a military shoe.
Coloboma of iris, severe.
Contraction of muscle, or paralysis, which disturbs function to the degree of interference with service.
Contraction, spastic, of the muscles of the neck if sufficient to prevent free rotation.
Cornea, ulcer of.
Cretinism.
Curvature of spine, if greater than 3 inches in lateral deviation or kyphosis or lordosis, severe enough to prevent wearing of equipment or uniform.
Cyanosis, in circulatory failure.
Deafness, total.
Deformities, congenital or due to fracture, injury or disease which seriously interfere with function and weight bearing power.
Deformities, of the nose, throat and mouth which interfere with the mastication of ordinary food, with speech or with breathing or that create an unsightly condition.
Deformities, postural, associated with disease of the sacroiliac and lumbosacral joints, obviously associated with muscular spasm, and limitation of motion in the lumbar region of the spine, and if malingering is definitely excluded.
Dermatitis herpetiformis.
Dilatation of heart, and hypertrophy evidenced by displacement of the apex impulse to the left of the midclavicular line or below the sixth rib.
Disease, malignant, of any organ or part of the body.
Dislocations, old, unreduced.
Dwarfism.
Dystrophies and atrophies, muscular, which are obviously disqualifying.
Edema, in circulatory failure.
Elephantiasis.
Emphysema.
Empyema.
Enlargement of thyroid, from any cause associated with toxic symptoms, or not associated with toxic symptoms but of sufficient size to interfere with wearing of uniform or equipment.
Epidermolysis bullosa.
Epilepsy.
Epispadias, if of a degree to interfere with normal micturition.
Esophagus, destructive lesions of.
Exophthalmic goiter.
Exostoses of skull, large, which will prevent the individual from wearing headgear of any branch of the armed forces.
Extremity, loss of.
Eyelid or eyelids, conditions of, such as inversion or eversion of such degree that forcible closure fails to cover the eyeball or in which there is a resultant conjunctival inflammation, corneal irritation or a restriction of the rotation of the eyeball.
Eyes, abnormal conditions of, due to disease of the brain.
Eyes, disfiguring scars of.
Feces, incontinence of.
Fingers, loss of more than three entire fingers of one hand.
Fistula, urinary, abdominal, osseous or postoperative.
Fistula of the anus.
Flat feet, if accompanied by marked symptoms and deformity.
Foot, complete or partial loss of.
Fractures, of the vertebrae or pelvic bones, with associated disqualifying rigidity.
Fractures, ununited.
Frohlich's syndrome, if severe.
Fungoides, mycosis.
Gigantism, or acromegaly if markedly disfiguring or if associated with other symptoms of severe pituitary dysfunction.
Glaucoma.
Goiter, exophthalmic.
Goiter, nontoxic, but of sufficient size to interfere with wearing of uniform or equipment.
Hallux valgus (displacement of great toe toward the other toes), if severe and associated with marked exostosis or bunion, especially when there are signs of irritation above the joint.
Hand, complete or partial loss of.
Heart, dilatation or hypertrophy of, evidenced by displacement of the apex impulse to the left of the midclavicular line or below the sixth rib.
Hemiplegia.
Hemorrhoids, external or internal, associated with prolapse of the rectum.
Hermaphroditism.
Hernia, complete, operable or inoperable.
Hernia of the brain.
Hip, diseases of, which seriously interfere with function and weight bearing power.
Hodgkin's disease.
Hydrocephalus, or monstrosity of the head.
Hypertrophy and dilatation of the heart evidenced by displacement of the apex impulse to the left of the midclavicular line or below the sixth rib.
Hypospadias, when opening is proximal to coronal sulcus.
Hysterical paralysis.
Idiocy.
Imbecility.
Immaturity as manifested by infantilism, or failure of development of secondary sex characteristics. Recheck in six months.
Impetigo, chronic.
Incontinence, feces or urine.
Insanity, with commitment, or history of commitment, or with authentic medical history of treatment for insanity without commitment.
Jaundice, in a degree and kind beyond any question of doubt. Recheck in six months.
Jaws, diseases of, and of associated structures which are likely to incapacitate the individual for satisfactory performance of duty. Extensive loss of oral tissue in an amount that would prevent replacement of missing teeth by a satisfactory denture.
Joint, tuberculosis of.
Keratitis.
Knee, diseases of, which interfere with function and weight bearing power.
Kyphosis of a degree sufficient to prevent wearing of uniform and equipment.
Lagophthalmos, if associated with signs of hyperthyroidism.
Laryngeal paralysis due to any cause.
Larynx, destructive lesions of.
Leg, amputation of.
Leprosy.
Leukemia of any type.
Lordosis, if of sufficient degree to prevent wearing of uniform or equipment.
Lumbosacral and sacroiliac joints, disease of, obviously associated with muscular spasm, postural deformities, or limitation of motion in the lumbar region of the spine, and if malingering is definitely excluded.
Lung, abscess of.
Lungs, tuberculosis of, active, or authentic history of treatment for, within preceding five years.
Lupus vulgaris.
Lymph nodes, enlargement of, in leukemia or Hodgkin's disease.
Lymph nodes, tuberculous.
Lymphosarcoma.
Malignant disease of any organ or part of the body.
Metallic poisoning, chronic, except argyria.
Monstrosity of the head, or hydrocephalus.
Mouth, destructive lesions of.
Mouth, gross abnormalities which interfere with mastication of food, with speech or with breathing or create an unsightly condition.
Multiple sclerosis.
Muscle, contraction or paralysis of, which disturbs functions to the degree of interference with service in the armed forces.
Muscular atrophies and dystrophies which are obviously disqualifying.
Muscular spasm, associated with disease of the sacroiliac and lumbosacral joints obviously associated with postural deformities, or limitation of motion in the lumbar region of the spine, and if malingering is definitely excluded.
Mutism.
Mycosis fungoides.
Myxedema.
Neck, enlargement of lymph nodes of, in leukemia or Hodgkin's disease.
Neck, spastic contraction of the muscles of, if sufficient to prevent free rotation.
Nephritis, acute or chronic.
Nose, destructive lesions of.
Nose, deformities of, which interfere with mastication of ordinary food, with speech or with breathing or which create an unsightly condition.
Orbit, any tumor of.
Osteoarthritis, complete or partial, of the spinal column.
Osteomyelitis, active, of any bone or a substantiated history of osteomyelitis of any of the long bones within the past five years.
Overweight, excessive, which is greatly out of proportion to the height if sufficient to interfere with normal activity or with proper training.
Ozena, chronic atrophic rhinitis with offensive odor.
Paget's disease (osteitis deformans).
Palate, cleft, with or without prosthetic appliance.

Paralysis, hysterical.
Paralysis, laryngeal, due to any cause.
Paralysis, or contraction of muscle, which disturbs function to the degree of interference with duty.
Paralysis, sphincter of the anus.
Paraplegia.
Parkinsonian syndrome, marked.
Pellagra.
Pelvic bones, healed fractures of, with associated disqualifying rigidity.
Pemphigus, chronic.
Penis, amputation of, if the resulting stump is insufficient to permit normal function of micturition.
Peripheral vascular diseases with manifest pathologic changes.
Pes planus, if accompanied by marked symptoms and deformity.
Poisoning, metallic, chronic, except argyria.
Postural deformities, accompanying disease of the sacroiliac and lumbosacral joints obviously associated with muscular spasm, and limitation of motion in the lumbar region of the spine, and if malingering is definitely excluded.
Prolapse of the rectum.
Ptosis of eyelids interfering with vision.
Purpura.
Rectum, prolapse of.
Rheumatic fever, acute or chronic, or history of recurrent attacks.
Rhinitis, atrophic, chronic, with offensive odor (ozena).
Ribs, tuberculosis of, and other parts of the chest wall.
Sacroiliac and lumbosacral joints, disease of, obviously associated with muscular spasm, postural deformities or limitations of motion in the lumbar region of the spine, and if malingering is definitely excluded.
Scars, adherent, of skin or soft tissue of a degree which seriously interfere with function.
Scars, disfiguring to such an extent as to be unsightly or which interfere with function of a limb or part to such a degree as to prevent satisfactory performance of service in the armed forces.
Sclerosis, multiple.
Sinus of the abdominal or chest wall.
Skin, adherent scars of, or soft tissues, to a degree which seriously interfere with function.
Skin, chronic ulcers of, if severe in degree or associated with varicose veins.
Skull, deformities of, of any degree associated with evidences of diseases of the brain, spinal cord, or peripheral nerves.
Skull, depression of, of a serious degree.
Skull, exostoses, large, which will prevent the individual from wearing headgear of any branch of the armed forces.
Spasm, muscular, with disease, of the sacroiliac and lumbosacral joints, obviously associated with postural deformities or limitation of motion in the lumbar region of the spine, and if malingering is definitely excluded.
Sphincter of the anus or urethra, paralysis of.
Spinal column, osteoarthritis of, partial or complete.
Spine, curvature of, if greater than 3 inches in lateral deviation, kyphosis or lordosis, severe enough to prevent wearing of uniform or equipment.
Spleen, great enlargement of, from any cause.
Spondylitis, disabling or deforming.
Stammering or stuttering to such a degree that the registrant is unable to express himself clearly or to repeat commands.
Strabismus, permanent, or well marked.
Syphilis, cerebrospinal, cardiovascular, visceral.
Sycosis (barbers' itch or other types). Reconsider after recovery.
Throat, destructive lesions of.
Throat, gross abnormalities of, which interfere with mastication of food, with speech or with breathing or create an unsightly condition.
Thumbs, loss of both.
Thyroid enlargement from any cause associated with toxic symptoms or not associated with toxic symptoms but of sufficient size to interfere with wearing of uniform or equipment.
Total deafness.
Tracheostomy.
Trachoma.
Transverse arch of foot, obliteration of, associated with permanent flexion of the small toes (claw toes) or with symptoms.
Tuberculosis, active, of any part of the body.
Tuberculosis, healed, of any portion of the vertebral column.
Tumor of brain.
Tumor of orbit.
Ulcer of cornea.
Ulcers, chronic, of skin, if severe in degree or if associated with varicose veins.
Urinary fistula.
Varicose veins, if severe in degree or associated with edema, or with present or previous ulcer of the skin.
Vascular diseases, peripheral, with manifest pathologic changes.
Veins, varicose, if severe or associated with edema or with present or previous ulcer of the skin.
Vertebrae, healed fractures of, with associated disqualifying rigidity or deformity.
Vertebral column, tuberculosis of any portion, healed.
Viscera, syphilis of.
Weight, excessive overweight which is greatly out of proportion to height if sufficient to interfere with normal physical activity or with proper training.
Xerophthalmia.

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Conditions which may not be manifest but which may be certified as disqualifying a registrant for service in any branch of the armed forces and classified as IV-F, when they are known to the examining physician, in accordance with section 623.33(*e*), as amended, of the regulations:

Acute diseases, other than venereal. Reconsider after recovery.
Addison's disease.
Alcoholism, chronic, to such a degree that it interferes with earning a living in civil life.
Anemia, pernicious, necessitating the constant parenteral administration of liver extract.
Diabetes insipidus, moderate or severe.
Diabetes mellitus, if severe or if necessitating the constant administration of insulin.
Drug addiction.
Enuresis, continuous, from childhood.
Epilepsy.
Hypoglycemia, chronic, persistent to such a degree that it interferes with earning a living in civil life.
Insanity with commitment or history of commitment or with authentic medical history of treatment for insanity without commitment.
Nephritis, acute or chronic.
Peptic ulcer, active, confirmed by x-ray examination.
Rheumatic fever, acute or chronic or with history of recurrent attacks.
Sex perversion.
Tuberculosis of any part, active within five years.

TREATMENT OF FRACTURES OF HANDS AND FINGERS CAUSED BY GUNSHOT WOUNDS

V. GUSYNIN

Professor, Chair of Neurosurgery at Lenin Postgraduate Medical College of Kazan and Consultant, Military Hospital of Tartar Soviet Republic

(The following article was received by cable from the Soviet Scientists' Antifascist Committee.—ED.)

Fractures of hands and fingers caused by gunshot wounds are frequent war injuries. The correct treatment is fixation and stretching the fingers over a solid cylindric body. This gives the fingers the physiologic half-contracted position. Fixation on a cylindric splint should be centralized on the fractured bone and pressure exerted on the point of fracture. This pressure prevents the bone fragments from moving, so that they heal and remain in position. A fixing bandage is applied with turns of the bandage crossing behind the broken bone at the point of fracture. The bandage passes between the fingers according to the position of the fracture in the direction of the wrist, around which transverse turns are made in both directions. The usual wide absorbent bandage is applied over the sterilized fixing bandage and is changed whenever it becomes saturated. The fixing bandage is not changed unless absolutely essential but is occasionally soaked with iodine. Healthy fingers must be left absolutely free.

I have also proposed the use of a so-called "drum splint," consisting of a wooden cylinder fixed to the split end of a flat splint. The flat splint is placed on the palm side of the forearm and injured fingers are placed around a cylinder. When necessary, the fingers are stretched by elastic bands fastened to the flat splint in a centripetal direction.

Fixation of fingers in a functionally essential position may also be carried out by use of a simple wooden roller.

In field conditions, a bottle 6 or 7 cm. in diameter may be used as a cylindric splint for fingers. The bottle is convenient because it can be used for physiotherapeutic heat treatment, the bottle being filled three or four times a day with warm water.

CIVILIAN DEFENSE

DR. BAEHR TO VISIT HAWAII

Dr. George Baehr, chief medical officer, Office of Civilian Defense, Washington, D. C., will leave San Francisco shortly for Hawaii. At the invitation of the governor of the territory, Dr. Baehr will confer with local authorities on civilian defense activities, which are being recognized now that the government of the islands is in the process of being transferred from the Army to civil authorities. He will remain in the islands about two weeks. En route to Hawaii Dr. Baehr will confer with Emergency Medical Service officers in California and will speak at the war conference of the California Hospital Association, Berkeley, on "Recent Observations in England and Scotland" and "Hospital Participation in the Emergency Medical Service."

EMERGENCY DISTRIBUTION OF BLOOD PLASMA

The Office of Civilian Defense, Washington, D. C., on February 15 issued additional details concerning Circular Medical Series No. 27, which is as follows:

1. The U. S. director of civilian defense has made arrangements so that the Civil Air Patrol will fly blood plasma supplies into stricken areas in the event of emergencies.

2. In instances in which, owing to bombing, fire, tornado or other cause it becomes necessary to supplement stocks of blood plasma in stricken areas, and when other methods of transportation are not available or are inadequate, the regional medical officer of civilian defense should contact the appropriate wing commander of Civil Air Patrol and request emergency air transportation for the plasma. Wing commanders have been authorized to accept such requests only from the regional medical officers.

3. In such event, give the wing commander complete details as to where the plasma is to be picked up and delivered. Arrangements should then be made by the regional medical officer to deliver the plasma to and from the airports.

4. These arrangements will apply for all states except those located within the jurisdiction of the Western Defense Command. In those states it is understood that the Western Defense Command has sufficient nontactical airplanes available to furnish such transportation.

5. Appropriate instructions, which will insure the efficient operation of this transportation facility, will be furnished to state and local chiefs of Emergency Medical Services by their regional medical officers.

6. The current list of wing commanders, Civil Air Patrol, is being furnished to the regional medical officers.

MISCELLANEOUS

PUBLIC HEALTH UNDER HITLER

Nieuwe Rotterdamsche Courant of Dec. 2, 1942 gives details of the increasing diphtheria epidemic. There were 12,225 cases in 1942 (there were 1,273 in 1939) and during the last few months there have been twice as many cases as during the first months of the year. There were 1,095 cases in August and 2,156 cases in October, about 250 cases a week in August and 650 a week in October. The greatest increase has been in North Holland, South Holland and Utrecht, and the smallest has been in North Brabant, Gelderland and Limburg, the very provinces where diphtheria has for a long time been prevalent and from which the illness has been spreading all over the country. It has been generally noted that older people have been the most affected by the disease. In 394 of the 1,034 municipalities young people under 14 have been vaccinated this year against diphtheria. The Rijksseruminstituut (National Serum Institute) is working under heavy pressure in order to be able to supply the necessary serum.

Reichs-Gesundheitsblatt, Berlin, of Dec. 23, 1942 contains a decree by the minister of the interior ordering the closing down of the Jewish lunatic asylum at Berndorf-Sayn. The Jewish hospital in Iranische Strasse, Berlin, will have a special mental ward which will serve as a substitute for the closed institution.

To insure economy in the use of quinine, the following points for doctors were published in *Reichs-Gesundheitsblatt,* Berlin, Dec. 16, 1942: Quinine must not be given as a prophylactic against grip or as a tonic. It is to be replaced by the sulfonamides in the treatment of bronchopneumonia and by aminopyrine in the treatment of general infections, sepsis and typhus, where it has sometimes been used to bring down the temperature. When necessary, it may still be prescribed together with synthetic drugs in the treatment of malaria.

According to Uj *Nemzedek* of Dec. 9, 1942, the government asked the alispan of Pest County (laszlo Endre) to set up a temporary isolation hospital equipped with 1,000 beds to counteract the epidemic of influenza, which is on the upgrade. The alispan answered that the means of the county were insufficient to set up a hospital and that for this reason those localities in which a large number of influenza cases occurred must themselves set up temporary hospitals.

The *Swiss Democrate* of January 22 reports that not only Chiasso but all the communes in the Canton Ticino all along the Swiss-Italian frontier have adopted strict precautionary measures against the dangers from the typhoid epidemic on the Italian side of the frontier.

According to *Upsala Nya Tidning* of January 5 at least 2,000 "inferior" Norwegians will be sterilized according to a new law.

Universul of January 7 reports that the Ministry of Education ordered medical students to examine all Rumanian school pupils on January 11. Infected pupils will be kept under observation.

ARMY-NAVY PRODUCTION AWARDS

Brig. Gen. John M. Willis, commanding general at Camp Grant, Ill., presented the Army-Navy E award to the president of Parke, Davis and Company, Dr. A. W. Lescohier, at Detroit, February 26. The insigne, an E pin, which every employee is entitled to wear, was presented by Lieut. E. B. Williams, senior medical officer of the Detroit Naval Armory, to Mr. John Tighe, who represented the employees. Dr. Edgar H. Norris, dean of Wayne University College of Medicine, presided. Among the guests were Capt. R. T. Brodhead and Comdr. A. M. Cohan of the Navy; Col. C. F. Shook and Major Roscoe Cavell of the Army Medical Corps; Mayor Edward J. Jeffries of Detroit; Dr. W. D. Barrett, president-elect of the Wayne County Medical Society; Dr. Bruce H. Douglas, health commissioner of Detroit; Dr. W. B. Cooksey, medical director, Detroit Section, the American Red Cross; Albert R. Pisa, president of the Detroit Retail Druggists Association; Dean R. T. Lakey of the College of Pharmacy of Wayne University; Dean E. P. Stout, College of Pharmacy, Detroit Institute of Technology; J. H. Webster of the Detroit Board of Education, and Warren E. Bow, superintendent of Detroit public schools. Mr. Joseph Roberts and Miss Lillian Payne, who have been employed by Parke, Davis and Company since 1892 and 1896 respectively, were among the honored guests.

Sharp & Dohme, Inc., pioneers in the development of dried plasma and producers in their Philadelphia and Glenolden laboratories of many other medical supplies for the armed forces, were awarded the Army-Navy E for excellence in production on February 10. The E pennant was presented by Brig. Gen. Hugh Jackson Morgan, chief consultant in medicine, Office of the Surgeon General, U. S. Army, Washington, D. C., and the individual E pins were presented by Commander E. L. Bortz, U. S. N. R., of the Naval Hospital, Philadelphia, to representatives of the employees of the company.

The Army-Navy E Production Award was presented to the men and women employed by the Ciba Pharmaceutical Products, Inc., of Summit, N. J., February 19, for excellence in war production.

ORGANIZATION SECTION

OFFICIAL NOTES

DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the Medical Departments of the United States Army and the United States Navy are on the air each Saturday at 5 p. m. Eastern War Time (4 p. m. Central War Time, 3 p. m. Mountain War Time, 2 p. m. Pacific War Time). An exception is the Chicago area, where the broadcasts are heard by transcription at 8 p. m. Central War Time Saturdays on station WMAQ until March 27, after which they will be heard at 10:30 p. m. Central War Time. Unless otherwise indicated each program is summarized by Dr. W. W. Bauer, Director, Bureau of Health Education.

The titles and speakers for the next four programs are as follows:

March 27. "War Worker Sleeps Here!"
April 3. "The White Plague, 1943."
Speaker: Dr. Kendall Emerson, managing director, National Tuberculosis Association.
April 10. "Battle Stations at Home."
Speaker: Col. George Baehr, Chief Medical Officer, Office of Civilian Defense.
April 17. "Stratosphere Flight."
Speaker: Brig.-Gen. David N. W. Grant, Air Surgeon, United States Army.

BEFORE THE DOCTOR COMES

The American Medical Association program on radio station WLS (890 kilocycles) entitled "Before the Doctor Comes" will be on the air every Thursday up to and including May 27 at 9:45 a. m. This program is intended to be helpful to the mothers of young children. Dr. W. W. Bauer, Director of the Bureau of Health Education, will be interviewed by Mrs. June Merrill on common home health problems. The titles for the next four programs are as follows:

March 25. "The Child with 'Tummy-Ache.'"
April 1. "The Child with Ear-Ache."
April 8. "What To Do About Cuts and Scratches."
April 15. "What To Do About Bad Bumps."

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 786 has passed the Senate and has been favorably reported to the House, a bill providing for the rehabilitation of disabled veterans of World War II. H. R. 1749 has passed the House and Senate, a bill granting hospitalization, domiciliary care and burial benefits to veterans of World War II. H. R. 1975 has passed the Senate, a bill to provide deficiency appropriations for the fiscal year ending June 30, 1943. The bill retains the provision providing that during the existing war, and for six months thereafter, any commissioned officer of the regular corps of the Public Health Service may be appointed to higher temporary grade with the pay and allowances thereof without vacating his permanent appointment and that reserve officers of the Public Health Service may be distributed in the several grades without regard to the proportion which at any time obtains or has obtained among the commissioned officers of such service. The bill appropriates for the use of the Public Health Service an additional amount of $85,500 for disease and sanitation investigations, and an additional amount of $428,500 for emergency health and sanitation activities. The limitation on the amount which may be expended for the procurement and establishment of reserves of blood plasma or serum albumin is increased from $420,000 to $499,500. The bill was amended in the Senate to authorize an appropriation of $1,200,000 for the fiscal year 1943, for use by the Children's Bureau in making grants to the states to provide medical, nursing and hospital maternity and infant care for wives and infants of enlisted men in the armed forces of the United States of the fourth, fifth, sixth or seventh grades. S. 785 has been reported to the Senate, authorizing an appropriation of $2,000,000 to provide for the expansion of facilities for hospitalization of dependents of naval and marine corps personnel and for hospitalization, outside of the continental limits of the United States, of officers and employees of any department or agency of the federal government and employees of any contractor with the United States or his subcontractor, and the dependents of such persons and, in emergencies, of such other persons as the Secretary of the Navy may prescribe.

Bills Introduced.—The President has submitted to Congress the Report of the National Resources Planning Board, to be made available as H. Doc. 128. This report, among other things, recommends an extension of the social security program to include permanent and temporary disability insurance, immediate action by the federal government in cooperation with the medical profession to enable every person to budget medical expenses over a reasonable period, and federal aid in developing an adequate system of regional and local hospitals, maternal and child care and other measures to assure "adequate medical and health care for all, regardless of place of residence or income status." S. 762, introduced by Senator Danaher, Connecticut, proposes to amend the Soldiers' and Sailors' Civil Relief Act of 1940, as amended, to afford relief in the case of certain leases made by corporations or partnerships. S. 838, introduced by Senator LaFollette, Wisconsin, provides for vocational rehabilitation of persons disabled in war industries or otherwise. S. 847, introduced by Senator Bilbo, Mississippi, provides for certain payments to needy blind individuals. H. R. 1826, introduced, by request, by Representative Lesinski, Michigan, provides for presumption of soundness at enlistment after six months' active service in the armed forces during the present war. H. R. 1978, introduced by Representative Maas, Minnesota, directs the director of the Selective Service System to award and cause to be issued to each registrant who has been rejected for active military service or deferred because of physical condition or essential work in the defense industry a suitable lapel button or pin to indicate that the individual is unable to enter the military service through no fault of his own. H. R. 1981, introduced by Representative Johnson, Indiana, proposes to amend the National Service Life Insurance Act so as to provide benefits for permanent total disability. H. R. 2100, introduced by Representative Patman, Texas, a bill to mobilize the scientific and technical resources of the nation, and to establish an Office of Scientific and Technical Mobilization. H. R. 2102, introduced by Representative Abernethy, Mississippi, a bill to exclude from gross income, for purposes of federal income taxes, amounts received as compensation for active service in the military or naval forces of the United States.

STATE MEDICAL LEGISLATION

Arkansas

Bills Introduced.—S. 363 proposes to authorize the creation, operation and maintenance of county boards of health in counties having a population of 100,000 or over. H. 382, proposes that all school teachers, school bus drivers, school cafeteria employees, school janitors and other school employees shall present a certificate of health, including skin test for tuberculosis, issued by a regularly licensed physician or a regularly

constituted health authority, not longer than three months prior to an application for a position in the school system. Such certificate shall be renewed each three years and the county and city health officers who issue same shall do so free of charge.

Bill Passed.—H. 432 passed the senate, March 6. It proposes to prohibit the sale of appliances, drugs or medicinal preparations having special utility for the prevention of conception or venereal diseases without a license issued by the state board of pharmacy but would except physicians and medical practitioners regularly licensed to practice medicine or osteopathy.

Bill Enacted.—H. 103 was approved, March 5. It provides for the appropriation of $15,000 to purchase pneumothorax equipment and to pay the fees of physicians for administering pneumothorax treatment to patients certified by the superintendents of the tuberculosis sanatoriums.

California

Bill Introduced.—S. 650, to amend the school code, proposes to authorize the school authorities to grant temporary exemption to pupils attending school during the time such pupils are working in industries, business, or in agricultural pursuits essential to the war effort, and further authorizes the superintendent of public instruction to set minimum health and physical fitness standards which each pupil shall be required to meet before being granted such temporary exemption.

Bill Enacted.—A. J. R. 26 has become Resolution Chapter 50 of the Laws of 1943. It resolves that the assembly and senate of the state of California indorse the pharmacy corps bill, S. 216 and H. R. 997, and request the Congress to enact the same into law.

Colorado

Bill Introduced.—S. 333 proposes to authorize the state board of health to declare emergency areas and to authorize all full time state, county and municipal public health officers who are graduates of medical schools approved by the state board of health and who possess licenses to practice their profession from the appropriate licensing authorities of Colorado or any other state to engage in the practice of medicine in Colorado, regardless of whether or not they hold licenses so to do from the licensing authorities thereof, until such time as the state board of health shall declare the emergency at an end. Such health officers shall charge the usual fees for services prevailing in the community and remit them to the state department of revenue.

Connecticut

Bill Introduced.—Substitute for H. 1073 proposes to authorize a jailer who has under his supervision a person whom he believes to be mentally ill to have such person examined by a reputable physician and, on recommendation of such physician, transferred to a state hospital for mental illness.

Bill Passed.—S. 261 passed the house, March 4. To amend the premarital examination law, it proposes to permit the required certificate to be signed by a physician licensed to practice medicine in the state of Connecticut or any state or territory of the United States or the District of Columbia.

Delaware

Bill Introduced.—House substitute for H. 66 proposes the creation of a state board of examiners in optical dispensing, defines optical dispensing as the filling or compounding of physicians' prescriptions for lenses and other optical devices, the surveying and measuring of external features of the face and head for the proper fitting of such lenses, and the fitting of such lenses to the user, and further proposes that the services and appliances relating to optical dispensing shall be dispensed, furnished or supplied to the intended wearer or user thereof only on prescription issued by a physician or an optometrist.

Georgia

Bill Introduced.—H. 141-194 A proposes a resolution urging the Congress of the United States to give its full and earnest support to the passage of H. 997 and S. 216, either of which would establish a pharmacy corps in the United States Army.

Idaho

Bill Enacted.—S. 140 has become chapter 134 of the Laws of 1943. To amend the occupational disease act, it authorizes the industrial board to summon the medical panel to attend hearings and authorizes the members of such panel to question witnesses.

Illinois

Bills Introduced.—S. 95 proposes the creation of a chiropractic board by the director of registration and education and defines chiropractic as the science of palpating and adjusting the articulations of the human spinal column, correcting interference with nerve transmission and expression, to restore health, without the use of drugs or surgery. S. 167 proposes the creation of a state board of health to take over the duties of the department of public health.

Bill Passed.—S. 21 passed the senate, March 10. To amend the traffic laws, it proposes that a person shall be deemed, prima facie, to be operating a motor vehicle under the influence of intoxicating liquor whose blood, urine, saliva or alveolar breath contains more than certain stated percentages of alcohol as determined by a chemical test of such breath or body fluid.

Indiana

Bills Passed.—S. 4 passed the house, March 4. It proposes the enactment of a law to license and regulate nursing homes. H. 66 passed the senate, March 6. It proposes the enactment of a law regulating the operation of plants for the cold storage of food in individual lockers. Among other things the bill proposes that all employees of such locker plants shall undergo a semiannual health examination by a physician and requires the employer to keep such health certificates on file at all times. Furthermore, the bill proposes to prohibit any person suffering from a communicable disease, including any communicable skin disease or with infected wounds, and any person who is a "carrier" of a communicable disease from being employed in any capacity in such locker plant.

Bill Enacted.—S. 134 has become chapter 222 of the Laws of 1943. It provides regulations for the sanitation of places in which food is made or handled and provides further that no person shall be employed in any such place who is affected with any venereal disease, smallpox, diphtheria, scarlet fever, yellow fever, tuberculosis or consumption, bubonic plague, Asiatic cholera, leprosy, trachoma, typhoid fever, epidemic dysentery, measles, mumps, German measles, whooping cough, chickenpox or any other infectious or contagious disease.

Kansas

Bill Introduced.—S. 167 proposes an act relating to state boards and commissions. Among other things, it would require the state board of medical examiners to make biennial rather than annual reports to the governor at least ten days prior to each regular session of the legislature and to make typewritten reports to the governor in the odd numbered years. In addition to biennial and annual reports, each state agency covered by the proposed bill may have printed such other reports, pamphlets, books and material as pertain to its activity and which are within the terms of a specific legislative authorization or appropriation.

Bills Passed.—H. 120 passed the senate, March 6. It proposes to excuse physicians in the military service from renewing their licenses annually and prohibits revocation of such license during such period. H. 121 passed the senate, March 6. To amend the medical practice act, it proposes to eliminate the requirement that no two of the required four six month periods which must be spent in the study of medicine and surgery may be given within the same twelve months. The purpose of this bill is to enable graduates of accelerated medical courses to obtain licensure in Kansas. H. 325 passed the house, March 5. It proposes to provide for treatment of nonresidents who have been diagnosed as having active tuberculosis.

Nevada

Bill Passed.—A. 141 passed the assembly, March 5. It proposes to authorize the board of medical examiners to grant qualified physicians a temporary license to practice medicine, surgery or obstetrics in any particularly specified part of the

state for and during the period of time limited by the license. The proposal would further authorize the board of medical examiners, from time to time, to restrict, enlarge or change the territorial limits stated in such temporary license.

New Jersey

Bill Passed.—A. 93 passed the senate, March 8. It proposes to amend the medical practice act by granting an extension of two years within which a licentiate must furnish proof of his actually having become a citizen.

New Mexico

Bills Introduced.—H. 223 proposes to repeal the existing law relating to the practice of chiropody. H. 247, to amend the basic science law, proposes to exempt therefrom persons engaged in the practice of the religious tenets of any church in the ministration to the sick or suffering by mental or spiritual means. H. 252 proposes to require every practitioner of medicine and surgery to register annually and fixes the fee for resident physicians at $2 and for nonresident physicians at $10.

New York

Bill Passed.—A. 1125 passed the assembly, March 8. To amend the medical practice act, it proposes to postpone until July 1, 1944 the 1942 amendment exempting students, interns and resident physicians from the operation of the medical practice act.

North Carolina

Bill Passed.—S. 254 passed the house, March 6. It proposes the creation of a Hospital Authority to engage in hospital construction, maintenance and operation.

Bills Enacted.—H. 429 was ratified, March 1. It provides that any person having tuberculosis in a communicable form who fails to follow the instructions given him by an agent of the county board of health as to precautions which he should take shall be imprisoned in the Prison Department of the North Carolina Sanatorium. H. 476 was ratified, March 4. It provides that persons serving in the armed forces or merchant marine shall be exempt from liability for any and all license taxes levied by the state or by any county or city in the state for the privilege of engaging in or carrying on any trade or profession in which such person was engaged before entering the service and further provides that such person during the period of service shall be exempt from paying any license fees to any licensing board or commission or to the state of North Carolina in which the payment of such license fee is by law required as a condition to the continuance of the privilege of engaging in any trade or profession. H. 513 was ratified, March 4. It authorizes the state board of optometry to make use of the injunctive process in restraining the illegal practice of optometry.

North Dakota

Bills Passed.—S. 58 passed the house, March 4. It proposes to amend the premarital examination law by authorizing the required laboratory test for syphilis to be performed by the state department of health or by any other state public health laboratory approved by the state health officer. S. 77 passed the house, March 4. It proposes to provide for the establishment, maintenance and duties of a district board of health and provides that the district health officer appointed by such board shall be a physician and surgeon regularly licensed to practice medicine and surgery in the state. H. 229 passed the senate, March 4. It proposes a law for the organization and regulation of nonprofit hospital service plan corporations.

Ohio

Bills Introduced.—H. 181, to amend the sales tax law, proposes to exempt therefrom the sales of "patent" and prescription medicines. H. 306, to amend the workmen's compensation act, proposes to authorize the furnishing of orthopedic appliances and artificial limbs to injured employees, in addition to any other compensation received.

Bill Passed.—S. 46 passed the senate, as amended, March 2. To amend the criminal code, it proposes that any person not being lawfully authorized to do so who shall mutilate or destroy any portion of the dead body of any person shall be guilty of a felony. The existing law already authorizes medical schools to obtain bodies for dissection purposes.

Oklahoma

Bills Introduced.—S. 98, to authorize the performance of postmortem cesarean sections on the body of a female who is the victim of death and who at the time of accidental death is in the advanced stages of pregnancy with possibilities of viable child, was amended in the senate to provide that such operation shall not be performed over the protest of those in whom the law has recognized a legal right to the possession of the body of the deceased. S. 144 proposes to require every physician making an examination of a person infected with a venereal disease to have a standard serologic test made of such person's blood. S. 253 proposes to provide for the commitment, custody, care and treatment of persons so far addicted to the intemperate use of stimulants as to have lost their power of self control or persons subject to dipsomania or inebriety. H. 249 proposes the creation of a special indemnity fund out of which employees would receive compensation for disability resulting because of the employee being a physically impaired person, defined to be a person who has suffered the loss of the sight of one eye, the loss by amputation of some member of his body, or the loss of the use, or partial loss of the use, of a specific member such as is obvious and apparent from observation or examination by an ordinary layman; that is, a person who is not skilled in the medical profession.

Bills Passed.—S. 98 passed the senate, March 4. It proposes to authorize a physician legally qualified to practice in the state of Oklahoma to perform a postmortem cesarean section when the physician has reason to believe that the child is viable in the mother. In the performance of such operation, the physician shall not be liable either civilly or criminally, provided only that the operation is performed in good faith and with due skill and without unnecessary injury or mutilation. H. 37 passed the house, March 1. It proposes that state and local officers, or their authorized deputies who are physicians, be empowered to detain and examine persons suspected of being infected with a venereal disease and authorizes the detention of such persons until the results of an examination are known. The examination must be made by a health officer or, at the option of the person to be examined, by an approved licensed physician.

Oregon

Bills Passed.—S. 284 passed the senate on March 4 and the house on March 5. It proposes to authorize the payment of compensation to employees disabled by an occupational disease. H. 229 passed the senate, March 9. It proposes to reenact and extend the existing law providing for state reimbursement to hospitals for services rendered victims of motor vehicle accidents so as to cover nurses and operators of ambulances. A provision also including services rendered by doctors was eliminated by the house. H. 103 passed the senate February 26. To amend the law relating to the examination of handicapped children, it proposes to authorize examinations of the eyes of such children to be made and the findings certified to by qualified and licensed optometrists. H. 350 passed the senate, February 26. It proposes to authorize commissioned medical officers of the army to execute the required certificate necessary under the state premarital examination law. H. 371 passed the house, February 26. It proposes an appropriation to pay for medical, surgical, corrective and other services and facilities for crippled children or children who are suffering from conditions which lead to crippling.

Bills Enacted.—S. 175 was approved, March 4. It increases the annual registration fee for physicians from $5 to $10 for the period beginning Jan. 1, 1944. H. 101 has become chapter 187 of the Laws of 1943. It amends the law relating to cosmetic therapy by proscribing the removal of warts, moles or other blemishes by an electrologist. H. 245 has become chapter 178 of the Laws of 1943. It requires persons maintaining a hospital for the treatment of persons with mental disorders or mental defects to obtain a license from the state board of health.

Pennsylvania

Bills Introduced.—S. 195, to amend the act relating to coroners, proposes that in all counties where a coroner or deputy coroner receives a salary and himself makes an autopsy or postmortem examination authorized to be made by him he shall be entitled, if he is a duly licensed physician or surgeon, to extra compensation from the county for making the same in such amount as the commissioners of the county shall fix. S. 244 proposes that for the duration of the war a minimum of nine months shall constitute the necessary training for an intern in a hospital approved for intern training to qualify for admission to an examination for licensure by the osteopathic surgeons' examining board to practice major surgery in Pennsylvania. H. 459, to amend the law relating to the practice of optometry, proposes that nothing in such law shall prevent the employment by any person, firm or corporation of a registered optometrist to be in charge of or to practice optometry in an optical department or store owned, controlled or conducted by a corporation. H. 504 proposes to exempt physicians in the armed forces or merchant marine from being required to renew their licenses during the term of such service and to authorize such persons to apply for renewal thereof at any time within one year after their discharge. H. 540 proposes the creation of a board of chiropractic examiners and defines chiropractic as the science of palpating and adjusting the articulations of the human spinal column. The proposal would further provide that nothing in the act should be construed to prevent any regularly licensed chiropractor, physician or surgeon of the commonwealth who has procured a license to practice chiropractic in accordance with the provisions of the proposal from practicing both medicine, surgery and chiropractic.

Bill Passed.—S. 103 passed the senate, March 2. It authorizes counties to create a medical clinic, composed of a psychiatrist, a psychologist and such investigators and clerical help as might be needed, which medical clinic shall pass on the mental and physical condition of all persons convicted of all crimes who are first offenders, obviously mental cases convicted of sex offenses or alcoholic or narcotic cases.

South Carolina

Bill Enacted.—S. 17 has become Governor's Act No. 24 of the Laws of 1943. It eliminates from the medical practice act the requirement that the necessary four full courses of lectures of at least twenty-six weeks each must have been given in four different calendar years. The purpose of this law is to enable graduates of accelerated medical courses to obtain licensure in South Carolina.

South Dakota

Bill Passed.—S. 129 passed the senate on February 26 and the house on March 4. As amended by the senate, it would exempt from the basic science act persons engaged in the practice of hydrotherapy. The original proposal also exempted persons acting as an assistant or under the supervision and direction of one holding a basic science certificate and teachers of physical education as taught in regular grade and high schools of the state.

Bills Enacted.—S. 186 was approved, March 1. It provides for an appropriation for the purchase and installation of hydrotherapy equipment in the state hospital for the insane. S. 202 was approved, March 4. It makes it unlawful to give for use as a beverage any intoxicating liquor to any person under the age of 18 years unless it is done in the immediate presence of a parent or guardian of such minor or by prescription or direction of a duly licensed practitioner or nurse of the healing art for medicinal purposes. H. 84 was approved, February 24. It amends the workmen's compensation act by adding necessary first aid treatment to the services to be furnished by an employer. H. 206 was approved, March 8. It authorizes the sterilization of inmates of the state hospital on recommendation of the superintendent when it is shown that the inmate suffers from certain mental diseases, perversion or diseases of a syphilitic nature and that the person is capable of procreation. The law also makes provision for the voluntary sterilization of any inmate.

Texas

Bills Introduced.—H. 529 proposes the creation of a state board of examination and registration for physicians and surgeons of the osteopathic school of medicine. Osteopathy is not defined, but the proposal would provide that each applicant who successfully passes the required examination shall be issued a license to practice as a physician and surgeon of the osteopathic school of medicine according to the provisions of the act and further provides that each license would give the holder thereof the unlimited right to practice medicine and surgery. It is further proposed that physicians and surgeons of the osteopathic school of medicine should have the same rights, privileges and immunities and stand charged with the same public duties and obligations as the duly licensed physicians and surgeons of any other school of medicine. Licenciates should observe and be amenable to all state and municipal laws, rules and regulations pertaining to reporting births and deaths, and all matters pertaining to public health, public sanitation, the control of infectious diseases, the compilation of vital statistics, health insurance, workmen's compensation, care of the indigent, and care of mothers and infants, with the same rights thereunder as duly licensed physicians and surgeons of any school of medicine; and reports of licenciates would be accepted by the officers of the state and municipal departments to which the same are made. Each licentiate would have the same rights with respect to the treatment of individuals and cases, the same right to register under the laws of the United States governing narcotics, the same right to hold public office and public employment and the same right to practice in state, county and municipal hospitals, as is conferred by any license that may be issued to any other licensee of any other school of medicine. Duly licensed physicians and surgeons of the osteopathic school of medicine and the duly licensed physicians and surgeons of other schools of medicine would be accorded equal and uniform privileges and opportunities in all state, county and municipal hospitals and in all institutions supported, maintained or operated in whole or in part by the state of Texas or any political subdivision thereof for the treatment of human disease, infirmity or ailment and in all hospitals which are tax exempt by reason of their charitable nature. H. 540 proposes to repeal the existing medical practice act and to enact a new medical practice act amending the existing law by, among other things, excluding therefrom licensed osteopaths and chiropractors who confine their practice strictly according to the definition thereof which may in the future be authorized by law, decreasing the personnel of the state board of medical examiners from twelve to six members, requiring licentiates to present a certificate from the board of examiners in the basic sciences, and repealing the provision requiring annual registration of licenses. H. 591 proposes to change the method of applying for admission to the state tuberculosis sanatorium.

Bill Passed.—H. 20 passed the house, March 4. It proposes the creation of a separate state board of examiners for chiropractors and defines chiropractic to be the science of analyzing and adjusting the articulations of the human spinal column and its connecting tissues without the use of drugs or surgery.

Utah

Bills Introduced.—S. 202 proposes the enactment of what appears to be the uniform narcotic drug act. S. 203, to amend the law relating to narcotic drugs, proposes to exempt therefrom the sale and administration of certain attenuated narcotic preparations.

Bill Enacted.—House concurrent memorial No. 1 was adopted, February 26. It resolves that the legislature of Utah endorse and recommend to the Congress of the United States the enactment of H. R. 997 or S. 216, either of which would establish a pharmacy corps in the regular army.

Vermont

Bills Introduced.—H. 88 proposes that any person who has sexual intercourse while infected with gonorrhea or syphilis in a communicable stage shall be imprisoned for not more than two years or fined not more than $500. H. 167 proposes to authorize the board of health to detain and examine persons suspected of being infected with a venereal disease likely to infect or to be the source of infection of another person.

Bills Passed.—S. 16 passed the senate, February 26. It proposes to authorize the institutionalization and treatment of persons who violate the criminal laws or who are guilty of gross immoral conduct because of mental deficiency, insanity or psychopathic personality. The latter term is defined as the existence in any person of such conditions of emotional instability or impulsiveness of behavior, lack of customary standards of good judgment, or failure to appreciate the consequences of his acts, as render him irresponsible for his conduct with respect to sexual or other criminal behavior and thereby dangerous to other persons. S. 34 passed the senate, March 9. It proposes that any person who maintains or operates a maternity hospital shall first obtain a license so to do from the department of public health. The term maternity hospital is defined as any hospital, institution or place in which pregnant or parturient women and the newborn infants receive care or treatment. H. 131 passed the senate, March 9. To amend the osteopathic act, it proposes to authorize a recognized school of osteopathy to give a course of thirty-six months rather than a four year course of at least five months in each year. H. 151 passed the house, March 4. To amend the premarital examination law, it proposes to authorize the execution of the required certificate by an osteopath and by a member of the medical corps of the army, navy or public health service.

Washington

Bills Introduced.—H. 179 proposes to prohibit any person from establishing or maintaining, outside the corporate limits of any town or city, a nursing home, rest home, home for aged or infirm persons or other similar institution without the permission of the county commissioners and authorizes the county commissioners to make rules and regulations relating to the establishment, maintenance and licensing of such institutions. H. 380 proposes to prohibit the maintenance of any rest and nursing home and institution without a license from the county or city commissioners wherein the institution is located. The term rest and nursing home and institution when used in the proposal are defined as meaning any home or private institutions, except hospitals approved by the American College of Surgeons or the American College of Physicians, for the care and housing of aged, infirm, ill persons or children. H. 408 proposes the creation of a sanipractic physicians' examining board and defines sanipractic as the science and art of applied prophylactic and therapeutic sanitation, which enables the physician to direct, advise, prescribe or apply food, water, roots, herbs, light, heat, exercises active and passive, manipulation, adjusting tissue, vital organs or anatomic structure by manual, mechanical or electrical instruments or appliances; or other natural agency, to assist nature to restore a psychologic and physiologic interfunction for the purpose of maintaining a normal state of health in mind and body. This proposal has been reported as being dead for the remainder of the current session.

Bills Passed.—S. J. R. 9 passed the house, March 2. It proposes a resolution to Congress to pass legislation establishing a pharmacy corps in the army. S. 218 passed the house, March 3. It proposes to authorize the director of licenses, during the present emergency, to grant temporary certificates to practice medicine and surgery to physicians duly licensed and qualified to practice under the laws of some other state and proposes that such temporary license shall be valid from the date of issuance until the next regular examination given by the board of examiners. S. 301 passed the senate, March 6. To amend the law relating to dentistry, it proposes that x-ray diagnosis and examination of the normal and abnormal structures, parts or functions of the human teeth, the alveolar process, maxilla, mandible or soft tissue adjacent thereto be declared to be the practice of dentistry.

West Virginia

Bills Introduced.—S. 238 proposes that no druggist shall fill any prescription containing strychnine or strychnine drug, arsenic, or arsenious oxide, or "arseine" compounds or where arsenic is "pentavalent," or neurotic, or any poisonous drugs so defined by the Pharmacopeia or by the United States, American or National Standard Dispensatory, unless the person requesting the prescription shall first fingerprint it. Committee substitute for H. 120 proposes to permit the organization of nonprofit, nonstock hospital service corporations and to authorize such corporations to furnish medical service and hospital service to subscribers. The medical service shall consist of medical and surgical care as specified in the subscriber contract issued by the corporation and shall be provided by duly licensed doctors of medicine.

Bills Passed.—H. 120 passed the senate, March 9. Prior to passage the proposal was amended to provide that hospital service corporations shall be declared to be scientific, nonprofit institutions and exempt from taxation. H. 230 passed the house on March 3 and the senate on March 10. It proposes, among other things, to require every physician who examines or treats a person having syphilis, gonorrhea or chancroid to instruct such person in measures for preventing the spread of the disease and to inform such person of the necessity of taking treatment until cured. If the person fails to report for treatment, the physician must make a report of such fact to the local health officer.

Wisconsin

Bills Introduced.—S. 208 proposes to authorize a court to admit in evidence, in prosecutions for operating a motor vehicle while under the influence of intoxicating liquor, testimony concerning the amount of alcohol in the accused's blood as shown by a chemical analysis of his breath, urine, or other bodily substance. S. 196 proposes to authorize the state department of public welfare to establish clinics for the diagnosis of mental illness and to authorize such clinics to accept patients for hospitalization therein on written application by such person or a relative, judge, sheriff or health officer accompanied by a medical certificate, signed by two physicians licensed to practice medicine and surgery, to the effect that the person mentioned in the application shows symptoms of mental illness other than alcoholism, inebriacy, or drug addiction and appears to be in need of hospitalization. The proposal would further exempt any physician signing such a certificate from civil liability for so signing. A. 33, to amend the law relating to the formation of cooperative associations, proposes that nothing therein shall interfere with the organization of voluntary associations or with contracts for medical or hospital service or both on the basis of a stipulated sum to be paid periodically. A. 60, to amend the income tax law, proposes to authorize the deduction, to the extent not compensated by insurance or otherwise, of amounts paid for professional services rendered by a doctor of medicine, dentist, osteopath or chiropractor for medicine and therapeutic treatment and amounts paid for hospitalization and care by a registered nurse other than in a hospital. A. 73, to amend the income tax law, proposes to authorize the deduction of payment for expenses for hospital, nursing, medical, surgical dental and other healing services and for drugs and medical supplies incurred by the taxpayer on account of sickness or of personal injury to himself or his dependents. A. 263, to amend the workmen's compensation act, proposes to require that an employee who submits to an examination at the request of his employer shall be furnished with a detailed report in writing of the examining physician's findings and conclusions. A. 297 proposes that every person in the practice of medicine, surgery, osteopathy or dentistry should make, keep and maintain a written record of professional services rendered to any person who has served in the United States army, navy or marine corps or any branch thereof and shall keep such records for not less than six years after the service is rendered. A. 305 proposes to require the annual registration of every person licensed to practice medicine and surgery, osteopathy, or osteopathy and surgery. A. 312 proposes to make counties having more than a certain population liable for medical care rendered by a physician and surgeon to certain persons entitled to such care at public expense. A. 324, to amend the law relating to chiropractors, proposes that one duly licensed to practice chiropractic shall be known and designated as "Doctor of Chiropractic" written after his name or as "Doctor" (his name), chiropractor or the abbreviations of either of such titles. A. 327 proposes a law relating to the establishment and administration of a system of health insurance. Under the proposal the term physician would mean any person licensed to practice medicine or surgery in the state.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Personal. — Dr. George D. Lyman, San Francisco, was recently elected president of the California Historical Society and Dr. Morton R. Gibbons, San Francisco, was elected a member of the board of directors.——Dr. Junius B. Harris, Sacramento, was recently chosen president of the California Academy of Medicine.

Popular Medical Lectures.—Stanford University School of Medicine, San Francisco, announces its sixty-first course of popular medical lectures to be given at Lane Hall. The schedule will be: Drs. Jacob C. Geiger on "Food Rationing and Civilian Health," April 2; Alfred C. Reed, "Tropical Diseases Menace United States at War," April 16; Loren R. Chandler, "Health Service to the Public During the Emergency," April 30, and John K. Lewis, "Protection of Health and Fitness in Flying Personnel," May 14. All are of San Francisco.

New Mental Clinic.—A mental clinic known as the Los Angeles Psychiatric Service has been set up in the Cedars of Lebanon Hospital, Los Angeles, through a special grant of Community Chest funds authorized by the Community Welfare Federation. Established on a one year demonstration basis, the unit is said to be the community's first psychiatric clinic for adults. It will be operated by a volunteer board of directors composed of business, professional and civic leaders interested in social welfare, of which Dr. Glenn E. Myers, Los Angeles, is chairman.

CONNECTICUT

Dr. Thorn Gives Alpha Omega Alpha Lecture. — Dr. George W. Thorn, Hersey professor of the theory and practice of physic, Harvard Medical School, Boston, gave the annual Alpha Omega Alpha Lecture in Brady Memorial Laboratory, Yale University School of Medicine, New Haven, February 11. His subject was "Clinical Aspects of Disturbances in Sodium Chloride Metabolism."

ILLINOIS

Society News.—Dr. Harry L. Huber, Chicago, discussed problems in allergy before the Will-Grundy County Medical Society at Joliet March 19.——The Kankakee County Medical Society was addressed, March 9, by Dr. Albert Vander Kloot, Chicago, on "The Anemias."

Chicago

The Lewis Linn McArthur Lecture. — Dr. Chester M. Jones, Boston, will deliver the nineteenth Lewis Linn McArthur Lecture of the Frank Billings Foundation on April 23 at the Palmer House. His subject will be "The Relationship Between the Nervous System and Pain Perception with Particular Reference to the Gastrointestinal Tract."

Dr. William Petersen Resigns at Illinois.—Dr. William F. Petersen recently resigned as professor of pathology at the University of Illinois College of Medicine. It is reported that Dr. Petersen will devote his time to private research on the weather and its effect on human beings, a field in which he has already carried on considerable work. He was a member of the staff at Vanderbilt University School of Medicine, Nashville, Tenn., from 1914 to 1917, when he joined the medical corps of the U. S. Army. He joined the Illinois faculty in 1919 and in 1924 was named to a full professorship.

INDIANA

Hospital News. — A three story hospital, including seven wards with a normal capacity of 180 beds, has been opened at the Indiana State Prison; the arrangement has been planned to meet the special requirements and problems confronting the medical services of a correctional institution.

Changes in Health Personnel. — Dr. James Carl Freed, Attica, has been named health officer for Attica.——Dr. Earle C. McBride, Terre Haute, was elected president of the city board of health.——Dr. James E. McMeel, South Bend, was elected president of the South Bend Board of Health recently, succeeding Dr. George F. Green, who has gone into military service.——Dr. Hugh A. Cowing was elected president of the Muncie Board of Health January 15. Dr. Herbert D. Fair was elected vice president and Dr. John H. Bowles was elected secretary. Dr. Ferrell W. Dunn and Mrs. Alfred N. Davis are members of the board.

LOUISIANA

University News.—Franklin Bliss Snyder, LL.D., Evanston, Ill., president of Northwestern University, gave the commencement address at the Louisiana State University School of Medicine, New Orleans, March 10, on "An Incident in the History of Fort Ticonderoga."

Physician Donates Rare Collection to Library.—Dr. Henry W. E. Walther, New Orleans, recently presented to the Howard-Tilton Memorial Library at Tulane University of Louisiana, New Orleans, a 700 volume collection of rare first editions, including the works of prominent English and American authors. Dr. Walther graduated at Tulane's school of medicine and later served there as professor of urology.

Kenny Treatment Center.—The division of crippled children of the Louisiana State Board of Health and the Charity Hospital of New Orleans are now operating a joint project in the hospital for treating acute paralytic poliomyelitis. The new service will be known as the Kenny Method Treatment Center. It will be considered a special orthopedic-pediatric service treating cases of acute paralytic poliomyelitis under isolated conditions as employed in infectious diseases, according to the *Bulletin* of the New Orleans Parish Medical Society. The management of patients will be carried out by members of the faculties of the Louisiana State University School of Medicine and the Tulane University of Louisiana School of Medicine, New Orleans, and the hospital staff.

MASSACHUSETTS

Physician Chosen President of Winthrop Subsidiary.—Dr. Bruno Thurber Guild, Boston, has been chosen president of Fairchild Brothers and Foster, a subsidiary of Winthrop Chemical Company, it was announced on February 10. Fairchild Brothers and Foster manufacture enzymes and other pharmaceutical products. Dr. Guild is a past president of the Dorchester Medical Society, consultant of the Council on Pharmacy and Chemistry of the American Medical Association and councilor of the Massachusetts Medical Society.

MICHIGAN

Epidemic Keratoconjunctivitis Now Reportable.—The state council of health at a meeting, January 7, added epidemic keratoconjunctivitis to its list of reportable diseases. All cases or suspected cases shall now be reported to the local health officer within twenty-four hours after diagnosis.

Changes in Health Officers.—Dr. Frederick A. Musacchio, Crowley, La., has been named director of the St. Joseph County Health Department.——Dr. Albert C. Edwards, White Cloud, director of the Fifth District health department, has resigned to become head of the St. Clair County Health Department. ——Dr. Fred T. Andrews has resigned as director of the health department of Bay County to become associated with the Fisher Body Division of the General Motors Corporation in Lansing.——Dr. George C. Stucky, Charlotte, health officer of Eaton County, was recently placed in charge of the Barry County Unit. The two units were combined for the duration.

Tri-State Medical Association Meeting.—The Northern Tri-State Medical Association, comprising the states of Indiana, Ohio and Michigan, will hold its annual meeting at the Rackham Building, University of Michigan, Ann Arbor, April 13, under the presidency of Dr. Howard H. Cummings, Ann Arbor. The program includes the following speakers from the medical school at Ann Arbor:

Dr. Cyrus C. Sturgis, The Clinical Significance of Leukopenia.
Dr. Frank N. Wilson, The Diagnosis and Treatment of Coronary Artery Disease.
Dr. Herman H. Riecker, Differential Diagnosis and Management of Hypertension.
Dr. Richard H. Lyons, The Management of the Edematous Patient.
Dr. Russell N. De Jong, Headaches; Diagnosis and Treatment.
Dr. Carl D. Camp, Emotional Influences on the Gastrointestinal Tract.
Dr. Arthur C. Curtis, The Treatment of Tinea Infections.
Dr. Frederick A. Coller, Fundamental and Clinical Consideration of Traumatic Shock.
Dr. Jack Matthews Farris, The Use of Reduced Temperatures in the Management of Peripheral Vascular Disease.
Dr. Reed M. Nesbit, Present Status of Hormone Therapy for Cancer of the Prostate.
Dr. F. Bruce Fralick, Discussion and Questions Commonly Asked About the Eyes by Patients.
Dr. Albert C. Furstenberg, Complications of Acute Upper Respiratory Infections.
Dr. Norman F. Miller, Caudal Anesthesia in Obstetrics.

NEBRASKA

State Meeting Canceled.—The Nebraska State Medical Association will not hold an annual session in 1943. A meeting of the house of delegates will be held in Lincoln May 4. Members wishing to attend this session will be welcome.

NEW YORK

Changes in Hospital Management.—Newspapers recently reported that St. Mary's Infant Asylum and Maternity Hospital, Buffalo, will be converted into a hospital for infants and children only and that the Central Park Hospital, Buffalo, was to be taken over, February 1, by the Sisters of St. Francis. It was also reported that the Providence Retreat, Buffalo, for the treatment of mental and nervous disorders will be used exclusively for maternity cases in the future. Both the Retreat and St. Mary's hospitals are owned and operated by the Sisters of Charity, the report stated. The name of the Providence Retreat will be changed. The shifting of these facilities was carried out because of the need for an additional maternity hospital in the area.

New York City

Meeting of Hispanic-American Medical Society.—The annual meeting of the Hispanic-American Medical Society of New York will be held at the New York Academy of Medicine on March 23. A symposium on hypertension will make up the program with Dr. Irvine H. Page, Indianapolis, presenting a paper entitled "Is Essential Hypertension of Renal Origin?"; Dr. George J. Heuer, "Value of Surgery in the Treatment of Hypertension," and Domingo M. Gomez, formerly of Paris University, Paris, France, "Hemodynamics and Mean Pressure."

New Committee on Psychosomatic Medicine.—The Kings County Medical Society and the Academy of Medicine of Brooklyn have announced the organization of a committee on psychosomatic medicine to arrange a teaching program in psychosomatic medicine for practicing physicians and to establish in local hospitals personnel trained in psychosomatic medicine who will be available for therapy and research. The committee consists of a chairman who is an internist with a psychoanalytic orientation, two psychiatrists, a cardiologist, a urologist, a gastroenterologist and a gynecologist. Others will be added as the need arises. Members include Drs. A. Nathaniel Rosen, Brooklyn, chairman; Irving J. Sands, Brooklyn, and Howard W. Potter, psychiatry; Alfred C. Beck, Brooklyn, obstetrics and gynecology; Leo S. Drexler, Brooklyn, urology; Henry F. Kramer, Brooklyn, gastroenterology, and Louis H. Sigler, Brooklyn, cardiology.

Goldwater Fund for Fellowship in Hospital Administration.—Under the will of the late Dr. Sigismund S. Goldwater a sum of money was left to Mount Sinai Hospital which, together with gifts from Mrs. Goldwater and friends of Dr. Goldwater, will provide an income of $1,000 annually to establish a fellowship in hospital administration and will be known as the Dr. S. S. Goldwater Memorial Fund. Recipients will receive the stipend of $1,000 during the year of appointment and be provided with residence in the hospital if an unmarried person. It will be made available to serious students and workers in hospital administration and should prove of most benefit to some one already in the field in a junior and even senior position. Previous hospital background and experience would provide an important foundation for the fellowship, which should prove especially useful to junior hospital administrators with a present hospital connection, who can secure a year's leave of absence if selected and who can return to their positions. The fellow's daily activities will be fitted to his own needs for hospital training and to his own capacities. Applications are now being accepted, since funds for the stipend are now available, the selection to be made by the board of trustees of the hospital. The benefits of the fellowship will not be limited to Mount Sinai Hospital.

OHIO

Dr. Mann Gives Alpha Omega Alpha Lecture.—Dr. Frank C. Mann, professor of pathology and experimental physiology, and surgery, University of Minnesota Graduate School, Rochester, Minn., delivered the Alpha Omega Alpha Lecture in the Institute of Pathology, Cleveland, March 12, on "The Value of Research in Medical Education."

Annual Meeting of State Society.—"Medicine on the Home Front" will be the theme of the ninety-seventh annual meeting of the Ohio State Medical Association at the Neil House, Columbus, March 30-31. Dr. Edward J. McCormick, Toledo, president of the association, will speak on "Adjustment of the Physician to Civilian Needs in Wartime." One session on "Medicine and the War" will be addressed by Drs. Robert Conard, Wilmington; Elmer L. Henderson, Louisville; Walter F. Donaldson, Pittsburgh, and Harold S. Diehl, Minneapolis. There will be general sessions on "Keeping them Working," featuring a symposium of subjects pertaining to industrial health with the following speakers:

Ralph Christopher Leggo, Columbus, surgeon, U. S. Public Health Service Reserve, director, industrial hygiene service, state department of health, Present Day Influences in Industrial Health.
Dr. Carl M. Peterson, Chicago, Secretary, Council on Industrial Health, American Medical Association, Essentials and Organization of Industrial Health Services.
Dr. Henry Close Hesseltine, Chicago, Women in Industry—Present and Future Problems.

A general session devoted to "Keeping them Healthy" will be addressed by Drs. Tom D. Spies, Cincinnati and Birmingham, Ala., on "Importance of Optimum Nutrition for the Civilian Population in Wartime" and John A. Toomey, Cleveland, "Importance of Immunization of the Civilian Population in Wartime." All sessions of the Woman's Auxiliary to the state medical association will be held at the Deshler-Wallick Hotel on March 30.

VIRGINIA

Institutes on Industrial Medicine.—The department of clinical and medical education and the committee on industrial health of the Medical Society of Virginia are cooperating in a series of five one-day institutes on industrial medicine in the Tidewater area. Meetings are being arranged at Newport News, March 22; Norfolk, March 23; Portsmouth, March 24; Suffolk, March 25, and Petersburg, March 26, under the sponsorship of the Peninsula Academy of Medicine, Elizabeth City County Medical Society, Norfolk County Medical Society, Portsmouth Medical Association, Nansemond County Medical Society and the Fourth District and Southside Virginia medical societies. The program will include the following speakers:

Dr. Orlen J. Johnson, Chicago, Industrial Medicine Today.
Dr. Hack U. Stephenson, Richmond, Compensation.
Drs. Everett I. Evans and Milton J. Hoover Jr., both of Richmond, Trauma-Shock and Burns.
Dr. William L. Weaver, Richmond, Industrial Medicine.
John E. Dunn Jr., passed assistant surgeon, U. S. Public Health Service, Bethesda, Md., Dermatosis.

WASHINGTON

Changes in Health Officers.—Dr. Arthur L. Ringle, Portland, Ore., has been appointed district health officer with headquarters at Walla Walla to succeed Dr. John A. Kahl. Dr. Willis E. Smick, Seattle, has been named health officer of Cle Elum.

Society News.—The Walla Walla Valley Medical Society recently was guest of the Veterans Administration Facility at Old Fort Walla Walla. Dr. Oliver M. Warner, Walla Walla, discussed "Diaphragmatic Hernia" and Lieut. Karl W. Pleissner, M. C., U. S. Army, "Protection in Gas Warfare and Treatment of Casualties."——Dr. Robert D. Forbes, Seattle, discussed "Progress in Abdominal Surgery" before the King County Medical Society, March 1. The society will be addressed, April 5, by Drs. Julius A. Weber on "Atelectasis of the Lungs: Postoperative and in the Newborn," and Thomas W. Blake, "Some Nontuberculous Pulmonary Conditions;" both are of Seattle.

WISCONSIN

Appointments to State Board of Health.—New members of the Wisconsin State Board of Health are Drs. Albert E. Rector, Appleton, to succeed Dr. Joseph Dean, Madison; Dr. Ira F. Thompson, Racine, to succeed Amalia C. Baird, R.N., Eau Claire; Dr. Gunnar Gundersen, La Crosse, to succeed Dr. Cornelius A. Harper, Madison, who resigned as state health officer and as member of the board, and Dr. William T. Clark, Janesville, to succeed Dr. Robert L. MacCornack, Whitehall. Dr. Carl N. Neupert, Madison, is the new state health officer (The Journal, January 30, p. 364).

Mickle Fellowship Awarded to Dr. Tatum.—The Charles Mickle Fellowship for 1942 at the University of Toronto, Canada, has been awarded to Dr. Arthur L. Tatum, since 1928 professor of pharmacology, University of Wisconsin, Madison. The award went to Dr. Tatum as "the member of the medical profession who has done most during the preceding ten years to advance sound knowledge of a practical kind in medical art or science." Dr. Tatum received his degree at Rush Medical College, Chicago, in 1914, having earned his Ph.D. at the University of Chicago in 1913. He has served as professor of pharmacology at the University of South Dakota and as assistant professor of pharmacology at the University of Chicago. In 1937 he was chosen president of the American Society of Pharmacology and Experimental Therapeutics.

GENERAL

Association of Anatomists.—The 1943 meeting of the American Association of Anatomists scheduled to be held at McGill University Faculty of Medicine, Montreal, has been canceled. As first vice president of the association, Dr. J. Parsons Schaeffer, Philadelphia, assumes the responsibilities of president of the association to succeed the late Edgar Allen, Ph.D., New Haven, Conn., and Dr. Eliot R. Clark, Philadelphia, has been named secretary-treasurer to succeed the late Francis H. Swett, Ph.D., Durham, N. C. Sectional meetings of the association will be held in Philadelphia and Chicago in April.

Dr. Bing Joins Institute of Baking.—Franklin C. Bing, Ph.D., Secretary of the Council on Foods and Nutrition of the American Medical Association, Chicago, has been appointed director of the American Institute of Baking, Chicago, effective March 15. Dr. Bing was born in Montgomery County, near Philadelphia, Dec. 29, 1902. He received his doctor of philosophy degree at Yale University, New Haven, Conn., in 1930. Prior to joining the American Medical Association in February 1936, Dr. Bing had been a member of the staff of the department of biochemistry at Western Reserve University, Cleveland. He is assistant professor of physiology at Northwestern University Medical School and a member of the Food and Nutrition Board of the National Research Council, Washington, D. C.

Conference of State and Provincial Health Authorities.—The forty-eighth annual Conference of State and Provincial Health Authorities of North America will be held at the District Medical Society Building, Washington, D. C., March 23, under the presidency of Dr. Carl V. Reynolds, Raleigh, N. C. Among the speakers will be:

Drs. Stanley H. Osborn, Hartford, Conn., John T. Phair, Toronto, Ontario, and James G. Townsend, Bethesda, Md., Industrial Health.
Drs. Frederick W. Jackson, Winnipeg, Manitoba, Wilton L. Halverson, Sacramento, Calif., George Baehr, Washington, and Albert S. McCown, Washington, National Defense and Disaster Relief.
Drs. George W. Cox, Austin, Texas, and Malcolm R. Bow, Edmonton, Alberta, John K. Hoskins, C.E., Cincinnati, Environmental Sanitation.
Drs. John F. Kendrick, Raleigh, Gregoire F. Amyot, Victoria, B. C., and William H. Sebrell Jr., Bethesda, Nutrition.
Dr. Phair, Dr. Roland R. Cross, Springfield, Ill., A. W. Fuchs, C. E., Washington, and Ollie E. Reed, M.S., Washington, Milk.
Drs. Henry Hanson, Jacksonville, Fla., Antonio Fernos-Isern, San Juan, P. R., and Rolla E. Dyer, Bethesda, Tropical and Subtropical Diseases.

A feature of the meeting will be the presentation of honorary life membership to Dr. Cornelius A. Harper, Madison, recently retired as health officer of Wisconsin. Meetings for which a program is not available will be those called by Dr. Thomas Parran, surgeon general of the U. S. Public Health Service, Washington, on March 24, and by Katharine F. Lenroot, LL.D., chief of the Children's Bureau, Washington, March 25.

Board of Orthopedic Surgery Revises By-Laws.—The American Board of Orthopaedic Surgery announces that under a revision of its by-laws now under way the examination will be divided into parts I and II. Applicants who have completed a rotating internship and one or two years of resident training in orthopedics or their equivalent in military service will be eligible for part I of the examination. This part will cover the basic sciences, fundamentals of surgery and elementary principles of orthopedic and fracture treatment with oral interviews and written examination. Tentative plans provide that part I may be given during the fall months in four different centers, probably in New York, Chicago, New Orleans and San Francisco. Part II of the examinations will probably be given as heretofore only once a year in connection with the meeting of the American Academy of Orthopaedic Surgeons. Applicants for part II must have completed their full requirements for eligibility, including their practice periods. The written examination and oral interviews will include advanced operative technic, standard orthopedic procedures, reviews of the literature and case records. Certification by the board will follow successful completion of part II of the examination. In order that the committee on eligibility may have adequate data for evaluation of the training of applicants who have served with the armed forces, a plan will be set up whereby all who are assigned to orthopedic services will be provided with an orthopedic service record. This record must indicate the character and amount of orthopedic work performed at each post to which prospective applicants are assigned. The fee schedule is also being revised. The board announces the revised rulings will be published and distributed by July 1943 so that prospective candidates may be governed accordingly. The dates of future examinations will be published at the same time. Dr. Guy A. Caldwell, 3503 Prytania Street, New Orleans, is secretary of the board.

Report of American Red Cross.—The expanded services of the American Red Cross to meet the needs occasioned by the United States' participation in World War II are outlined in the organization's annual report for the year ended June 30, 1942. Since the organization of the first camp and hospital service council at Fort Dix in July 1941 the program has been extended during the year to seventy-three councils representing 817 chapters, and approval was given to about thirty-five additional councils. Full time representation was made available at eighteen regional offices out of fifty-three served, and additional services will be developed as the need increases. On July 1, 1941 the personnel of services to the armed forces totaled 641 while on June 30, 1942, the total was 3,088, an increase of 381 per cent. On June 30, 1942 the hospitals in continental United States were staffed with 527 workers as follows: 178 medical social, psychiatric social and other social workers, 166 recreation workers and 183 clerical personnel. The bureau of army affairs handled 18,780 cases as compared with 4,289 for the previous year, the increase caused mainly by inquiries from families of service men concerning their welfare after Pearl Harbor. Information was requested from the War Department on 6,758 service men as compared with 737 similar requests during the previous year. Tremendous increases were also noted in similar services by the bureau of naval affairs.

From July 1, 1941 to June 30, 1942 the Red Cross extended relief in 172 disasters in forty-two states. In all 72,434 persons were aided at a total expenditure of $1,233,292.37. Disasters in continental United States for the year number fifteen more than the peak year of 1938-1939, when the total reached 157. Though most of the disasters were minor in point of numbers of families affected, the large number of operations necessitated an expenditure for disaster relief of $286,668.81 in excess of the $946,626.56 spent during the previous year. The largest single operation was necessitated by a series of destructive tornadoes which struck during the week of March 15, 1942 in fifty-two counties of Mississippi, Tennessee, Alabama, Kentucky, Indiana and Illinois. The Red Cross provided rehabilitation assistance for 1,077 families out of a total of 2,249 affected. Ninety per cent of the assistance was given to farm families. One hundred and fifty-one persons were killed, 600 were seriously injured and 500 received minor injuries. Of the 442 hospitalized, only seventeen remained in hospitals June 1, 1942. Thirty-eight disasters were caused by tornadoes and floods in Arkansas, Colorado, Illinois, Indiana, Kansas, Missouri, Minnesota, Nebraska, North Dakota, South Dakota, Oklahoma, Texas, Wisconsin, Iowa and Michigan, the largest number of disasters for a like number of days in the history of the Red Cross. The greatest disaster of the year in a single community occurred in Pryor, Okla., April 27, when a tornado killed 44 persons and injured 277. Hospitalization was necessary for 225 of the injured. From April 20 to 22, thirteen counties in the central part of east Texas were affected by the heavy rise in waters of the Trinity River and its tributaries. The Red Cross assisted 2,034 with emergency and rehabilitation relief of the 3,430 families affected.

During the year 778 Red Cross public health nurses, paid in full or in part from chapter funds, have cared for 242,052 patients, requiring a total of 897,260 visits to homes, to physicians and to agencies in behalf of patients and to individuals receiving health supervision; 306 chapters sponsored 441 nursing services. More than 348 nurses gave a total of 3,093½ days of service in thirty-one disaster relief operations.

In its participation in the development of blood donor service, the Red Cross has centers in New York, Philadelphia, Baltimore, Buffalo, Rochester, N. Y., Indianapolis, Detroit, Pittsburgh, St. Louis, Cincinnati, Brooklyn and Washington, D. C.

During the year, 1,731 chapters with a staff of 16,093 nutritionists and instructors offered the standard nutrition and canteen courses. The organization has cooperated with state nutrition committees in providing refresher courses, the activities of the Red Cross in this field being primarily educational. A total of $25,309,738.17 was expended by the American Red Cross in carrying out its various programs of aid and maintenance of organization.

CORRECTION

School of Tropical Medicine of the University of Puerto Rico.—In the item concerning the Ashford General Hospital in the Medicine and the War section of THE JOURNAL, February 20, page 599, the year which the School of Tropical Medicine of the University of Puerto Rico was established was erroneously given as 1936. This school was opened in September 1926 (THE JOURNAL, July 31, 1926, p. 332).

Foreign Letters

LONDON

(From Our Regular Correspondent)

Feb. 6, 1943.

Cancer Research

Like most of our ordinary activities, cancer research goes on notwithstanding the war. At the nineteenth annual meeting of the British Empire Cancer Campaign reports from twenty-four research departments or branches in this country and from eleven overseas were announced. The finding by Bittner in the milk of female mice of high cancer strain a factor concerned in the development of spontaneous breast cancer gave rise in the department of experimental pathology and cancer research of the University of Leeds to a study of the effects of estrogenic stimulation on male mice. The newborn of high breast cancer were at once transferred to mothers of low breast cancer strain, and vice versa. After weaning, injections of triphenylmethylene were made and continued until death. The results showed an almost complete reversal of the expected incidence of cancer. Of the mice which died only 1 mouse suckled by a low breast cancer foster mother developed breast cancer, whereas all but 3 of the low breast cancer mice suckled by a high breast cancer foster mother died of breast cancer. In another laboratory, at Newcastle-on-Tyne, the incidence of breast cancer in mice of low cancer strain was raised from 5 to 60 per cent by fostering them on females of high cancer strain.

The clinical research committee of the campaign has analyzed 473 cases of cancer of the esophagus registered in London hospitals during 1938 and 1939. In 67 per cent the first symptom was dysphagia; in the remainder misleading symptoms led to mistaken diagnosis. Radical surgery was possible in only 5 cases. Exploratory operations had a high mortality. Radium treatment was disappointing. Of the 473 cases 399 were fatal in the first year, 19 in the second and 5 in the third. Sixty-five cases of postcricoid carcinoma were also analyzed; there were 56 deaths in the first year from the beginning of treatment, 3 in the second year and 1 in the third. Two of the remaining patients are known to be still alive and 3 are untraced. A curious sex difference was found between the two groups. Of the patients with postcricoid cancer 54 (83 per cent) were female, whereas of the 473 with esophageal cancer only 76 (16 per cent) were female. The mean age of the postcricoid patients was 65 years for males and 55 for females; of the esophageal patients, 64 for males and 61 for females.

The Royal College of Physicians and Housing Schemes

Before the war the health authorities were engaged in a housing effort which was producing over three hundred thousand houses annually. This had to be suspended because of the war, after which there will be an accumulated deficiency. Steps are already being taken to start again on the cessation of hostilities. The Ministry of Health has appointed a central advisory committee which is drawing up a program. At its request the Royal College of Physicians has given advice on features which have a bearing on health. A committee of the college states that in planning the importance of sunshine, warmth, light and air must be considered. In cottage estates the rooms most commonly used, at least one of which should be a bedroom, should face south to southeast. In block dwellings the major axis should run from north to south, so that the majority of flats face east and west. "Wells" which overshadow one block by another should be avoided.

The main health feature of structure is complete protection from dampness. Care should be taken to prevent noise, and the siting of windows should be governed more by the calls of health than by external symmetry. The college does not regard as adequate the present standards of floor space and area of rooms. It recommends that in a house of three bedrooms no room used for sleeping should be smaller than 100 square feet and that the second bedrooms, presumably to be used for children, should be as large as the first. A local authority should reject plans of a new house or extension of a house unless baths with a piped supply of hot and cold water and a sink with hot and cold water are provided. A living room in which neither cooking nor washing is carried out is essential, and three bedrooms should be the minimum for all families of two or more persons, except aged couples. In the reconstruction of cities there are great opportunities for providing open spaces.

The college, being concerned for the protection of children from traffic dangers, the promotion of community health centers and community feeding and services for social health, recommends that housing estates should be grouped on a community basis. In populous areas at any rate provisions should be made for cheap, wholesome meals. All the services for preventive medicine, including infant welfare, school health services and supervision of adolescents and industrial workers, should be brought together as a health center under one roof.

The Wartime Increase of Tuberculosis

A recent report of the Medical Research Council shows an increase of deaths from tuberculosis since the beginning of the war in all age groups. The report states that under war conditions primary infection among those who have reached adult life uninfected has probably increased. It therefore urges that physicians should pay special attention to all cases of pleurisy, erythema nodosum and phlyctenular conjunctivitis. Such cases, as well as those of hemoptysis without apparent cause, should be referred to the tuberculosis officer for full investigation, follow-up examinations and search for source of infection within their families. The importance of this is shown by a survey of 2,000 patients with tubercle bacilli in their sputum. Of these, 27 per cent had a history of untreated pleurisy or hemoptysis three or four years before a diagnosis of pulmonary tuberculosis was made. Physicians are also asked to refer cases of suspected glandular, abdominal and other nonpulmonary tuberculosis to the tuberculosis officer for radiography of the chest, so that search for contacts may be made.

The Functions of the Pyloric Canal

At a meeting of the Section of Anatomy and Physiology of the Royal Academy of Medicine in Ireland, Dr. J. W. Millen drew attention to the importance of the pyloric canal as a distinct region of the stomach which differed in anatomy, mobility and function from the other parts. In the normal stomach three parts could be recognized: (1) a region for reception and storage, which was present in all but the lowest invertebrates, (2) a terminal closing mechanism—the pyloric sphincter—which assisted in the maintenance of storage, and (3) an active milling region—the pyloric canal—for the trituration and fine subdivision of food. The storage region comprised the body and fundus and the more or less well defined pyloric antrum for the active filling of the pyloric canal.

Roentgenograms of the stomach of a young adult showed that in the early stages of canalization by an opaque meal the food did not at once enter the pyloric canal. When a small amount of the meal was manually pressed into the pyloric canal, the longitudinal folds of the mucous membrane could be seen in the canal and the pyloric sphincter was well defined. After about half a pint of the meal had been given, further roentgenograms showed that the pyloric canal had become rounded and globular but was still a separate region filled from the pyloric antrum by deep peristaltic waves which traversed it. But in about a third of dissecting room subjects examined no pyloric canal could be defined, the whole stomach being a single cavity.

In the remaining two thirds the normal subdivisions as described were found. The absence of a pyloric canal in the former group might be due to its incorporation in the proximal part of the stomach and represent a shift toward the single chamber of adult carnivores.

The pyloric canal therefore had two functions—as an active milling region and in the emptying of the stomach, either as an active or as a passive region coordinated with the body of the stomach. Congenital hypertrophic stenosis of the pylorus was a hypertrophy of the pyloric canal, not of the pyloric sphincter. It might therefore be due to the pyloric canal functioning as a mill but failing to act in harmony with the proximal part of the stomach in its function as part of the emptying mechanism.

Cooperation of Rheumatism Specialists and Orthopedic Surgeons

Rheumatism in its various forms is so prevalent as to be a national problem. The Empire Rheumatism Council and the British Orthopedic Association have agreed that their mutual cooperation in the diagnosis, prevention and treatment of crippling conditions would be of great service to the community. They aim at a close liaison between the physician specializing in rheumatism and the orthopedic surgeon, seeking to enlist the cooperation of the general practitioner, the public health services and social workers generally. They hold that orthopedic hospitals and orthopedic departments of general hospitals should have on their staffs a physician with special knowledge of rheumatic diseases and that rheumatism centers should have on their medical staffs an orthopedic surgeon. Since the application of methods of physical and occupational therapy for orthopedic and rheumatic patients is largely identical, a joint outpatient clinic should, wherever practicable, serve for both classes of patients.

In view of the growing appreciation of the regionalization of medical services, the scheme for the rheumatism treatment centers should be planned to fit into such schemes as may be arranged for the future. This has already been done in orthopedic schemes, in which the development of the centers is based on the legal requirements of the notification of certain crippling diseases and on the public responsibility for the provision and payment for their treatment. So in rheumatic diseases a similar responsibility should be assumed by the state and the local authority. Provision for the training of young physicians and surgeons in research, diagnosis and treatment should be associated with suitable encouragement to make the study of rheumatic disease a life work. To put into effect the agreed plan of cooperation, a joint standing committee of eminent rheumatism specialists and orthopedic surgeons, under the chairmanship of Lord Horder, has been appointed.

Road Accidents in 1942

The road accidents for December were the highest of any month of 1942: 780 killed and 12,842 injured, compared with 1,024 killed and 18,300 injured in December 1941. Since the war the December accident peak has been more pronounced because of the blackout accidents. Last December nearly three fourths of the pedestrians killed, other than children, lost their lives during the hours of darkness. Fatalities to children, including cyclists, numbered 109, and 1,650 were injured.

The number of deaths on the roads of Great Britain in 1942 was 6,926. This is a decrease of nearly a fourth compared with 1941, but not so great as might have been expected considering the fewer vehicles on the road. Early in 1941 the danger of road accidents was increased by the heavy enemy night raids and consequent hurry to get home.

During 1942, 1,315 children were killed, against 1,462 in 1941. A possible cause of the high proportion of accidents to children is that many persons are engaged in war work and cannot exercise the supervision they would give in normal times.

BRAZIL

(From Our Regular Correspondent)

Feb. 26, 1943.

The Work Against Yellow Fever in Brazil

The 1941 annual report of the National Yellow Fever Service of Brazil contains interesting information. Up to 1930, when the Vargas régime began in Brazil, the control of yellow fever was the duty of various authorities, and this continued until Dec. 31, 1941, when the government obtained the cooperation of the International Health Board of the Rockefeller Foundation. The work was then reorganized and unified, with the creation of a new organization under the name of National Yellow Fever Service. This is an extensive single organization dealing with an important health problem particularly since the discovery of the widespread sylvatic form of the disease. The practical results of the new organization were such that several countries of South America followed the example of Brazil, putting all the control measures of yellow fever under the technical guidance of Dr. Fred L. Soper of the Rockefeller Foundation, with Rio de Janeiro becoming the coordinating center of the whole work. In 1932 a complete code of the control measures was approved by the Brazilian federal authorities, and such a code has been lately adopted by several foreign governments, as those of Argentina, Bolivia, British Guiana, Colombia, Ecuador, Paraguay, Peru and Venezuela. The Brazilian service has functioned as a training school for medical officers and technicians from the United States as well as from Argentina, Bolivia, British Guiana, British colonies of Africa, Belgium, Colombia, Cuba, France, Germany, Peru and Venezuela. For the first time in campaigns against yellow fever, a technic of intensive specific measures has been created against Aedes aegypti (Stegomyia), that resulted in the eradication of this species of mosquito from extensive areas. For a few years there have been no stegomyias in six of the twenty states of Brazil and the Federal District (Rio de Janeiro city), and in the rest of the country the stegomyia index (percentage of water deposits presenting larvae and pupae) is very low. For the control of Aedes aegypti, more than 338 million inspections of dwellings and almost 2 billion inspections of water deposits have been done between 1932 and 1941. The service expects that Brazil with its 3,228,000 square miles and 45 million inhabitants will be free of the stegomyia mosquito within a few years. From 1941 to the present, no more cases of stegomyia transmitted yellow fever have been registered.

But the control of the stegomyia is important only in urban and suburban areas, because for a decade it has been known that many cases of illness occurring in the forested areas were true cases of the same urban yellow fever, but the infection was not transmitted by Aedes aegypti. Evidence has accumulated that the mosquitoes Aedes leucocelaneus, Hemagogus capricornius and Sabethinus are responsible for the transmission of the disease in the jungles, where any mosquito control work is impracticable. The control of the sylvatic form of the disease depends on the extensive use of viscerotomy and of vaccination (THE JOURNAL, Jan. 10, 1942, p. 159). There are now more than 1,500 localities where the service of viscerotomy is performed as a routine measure, and more than 30,000 samples of liver have been examined by the pathologic laboratory annually since 1938. To help in the epidemiologic investigations, more than 9,000 samples of blood serum have been used annually since 1939 in the performance of the white mouse protection test. The most effective measure to protect the rural population against yellow fever is immunization. The report shows that 158,034 vaccinations were performed in 1941, thus raising to more than 2 million the total of persons vaccinated against yellow fever since 1938. The annual number of jungle cases of the disease has been 263 in 1938, 130 in 1939, 172 in 1940 and only 19 in 1941. According to the latest information, just a few cases have been recognized during the year 1942.

Deaths

John Finch Barnhill, Miami Beach, Fla.; Central College of Physicians and Surgeons, Indianapolis, 1888; practiced in Indianapolis since 1888 and specialized in surgery of the head and neck; since 1930 professor emeritus of surgery of the head at the Indiana University School of Medicine, where he had been professor of otology, laryngology and rhinology and later professor of surgery of the head and neck; in 1927 retired after thirty-eight years' service as a teacher at the university and its predecessor, continuing in an advisory capacity; was an honorary professor of anatomy at the University of Southern California School of Medicine, Los Angeles; specialist certified by the American Board of Otolaryngology; secretary of the Section on Laryngology and Otology, 1901-1903, and chairman in 1903-1904 of the American Medical Association and member of its House of Delegates in 1905 and in 1920; vice president of the American Ear, Throat and Nose Association in 1908; charter and honorary member of the Indianapolis Ophthalmological and Otolaryngological Society; member and in 1931 president of the American Academy of Ophthalmology and Otolaryngology; member and in 1928 president of the American Laryngological, Rhinological and Otological Society; member and in 1937-1938 president of the American Laryngological Association; member of the American Otological Society, Inc.; fellow of the American College of Surgeons; served as ear, nose and throat consultant at the City and Deaconess hospitals, Indianapolis; on the editorial board of the *Archives of Otolaryngology*; author of a textbook on "Nose, Throat and Ear"; co-author of "Principles and Practice of Modern Otology," "Surgical Anatomy of the Head and Neck" and other books; received the LL.D. from his alma mater and the Indiana University in 1929; aged 78; died, March 10.

William Anderson Snodgrass ✠ Little Rock, Ark.; Arkansas Industrial University Medical Department, Little Rock, 1897; emeritus professor of surgery at the University of Arkansas School of Medicine; at one time professor of principles of surgery and clinical surgery at the College of Physicians and Surgeons, Little Rock; past president and for many years a member of the State Medical Board of the Arkansas Medical Society; past president of the Pulaski County Medical Society; fellow of the American College of Surgeons; formerly secretary of the board of health of Pulaski County; at one time city physician; veteran of the Spanish-American War; organized and accompanied the Red Cross Hospital Unit T to England; served as a major in the medical corps of the U. S. Army during World War I and received the Distinguished Service Medal for bravery during the battle of the Marne; formerly secretary and general medical manager of the College of Physicians and Surgeons Hospital; on the staffs of the Little Rock General Hospital, Children's Hospital and the Baptist State Hospital, where he died, January 4, of myocarditis and hypostatic pneumonia, aged 68.

James Alexander Clarke Jr. ✠ Philadelphia; Jefferson Medical College of Philadelphia, 1918; specialist certified by the American Board of Internal Medicine; associate in medicine at his alma mater; assistant in medicine at the Columbia University College of Physicians and Surgeons, New York, 1918-1919, and assistant in clinical pathology from Feb. 1, 1919 to June 30, 1919; member of the American Association for the Study of Allergy and the Philadelphia College of Physicians; past president of the Society for the Study of Asthma and Allied Conditions; chief of the allergy service at the Germantown Dispensary and Hospital; formerly on the staffs of the Vanderbilt Clinic and the Roosevelt Hospital, New York, and the Seaside Hospital of St. John's Guild, Staten Island; since Sept. 27, 1922 on the staff as consultant in allergy at the Veterans Administration Facility; for many years assistant physician on the staff of the Philadelphia General Hospital; chief clinical assistant in the department of applied immunology at the Jefferson Hospital, where he died, January 31, of carcinoma, aged 51.

Lorenzo Nelson Grosvenor, Huron, S. D.; Chicago Homeopathic Medical College, 1889; Rush Medical College, Chicago, 1902; member of the House of Delegates of the American Medical Association in 1931; member and in 1930 president of the South Dakota State Medical Association; fellow of the American College of Surgeons; past president and secretary of the Huron District Medical Society; specialist certified by the American Board of Ophthalmology; at one time practiced in Chicago, where he had been instructor of ophthalmology at Rush Medical College, on the staff of the Illinois Charitable Eye and Ear Infirmary and a member of the Chicago Ophthalmological Society; superintendent of the Beadle County Board of Health; aged 74; died recently in Rochester, Minn., of coronary occlusion and hypertrophy of the prostate.

Edward Henry Risley ✠ Loma Linda, Calif.; American Medical Missionary College, Chicago, 1904; Medical Department of the University of California, San Francisco, 1911; dean, professor of chemistry, member of the board of trustees and past president of the College of Medical Evangelists; instructor in chemistry, 1905-1906, and professor of chemistry from 1906 to 1910 at the American Medical Missionary College, Battle Creek, Mich.; president of the San Bernardino County Medical Society; on the staff of the Loma Linda Sanitarium and Hospital; co-author of "The Food Question," "Foods, Nutrition and Clinical Dietetics" and "Home Physician and Guide to Health"; aged 61; died, February 7, of cerebral hemorrhage and arterial hypertension.

William Pitt Baker, Pine Bluff, Ark.; Arkansas Industrial University Medical Department, Little Rock, 1891; graduated from the West Point Military Academy in 1887 and joined the Tenth Infantry at Fort Union, New Mexico Territory, in the same year; was active in organizing the First Infantry of the Oklahoma National Guard; served during the Spanish-American War, the Boxer Rebellion in China and World War I; was chief surgeon and chief of the Information Division of the Philippine Islands Constabulary; formerly professor of medical chemistry and toxicology at his alma mater, now known as the University of Arkansas School of Medicine; mayor of Rosboro for six years; aged 79; died, December 11.

Sylvester James McNamara, Brooklyn; Long Island College Hospital, Brooklyn, 1892; member of the Medical Society of the State of New York; past president of the South Brooklyn Medical Society and the Brooklyn Gynecological Society; fellow of the American College of Surgeons; consultant at the Kings Park (N. Y.) State Hospital and the Coney Island Hospital; consulting obstetrician and gynecologist at the Kings County Hospital; consulting obstetrician and gynecologist and for many years secretary of the council of the Long Island College Hospital, where he died, January 31, of coronary thrombosis, aged 73.

Margaret Schulze ✠ San Francisco; University of California Medical School, San Francisco, 1916; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; member of the Pacific Coast Society of Obstetrics and Gynecology; fellow of the American College of Surgeons; assistant professor of obstetrics, gynecology and pathology at her alma mater; visiting pathologist, obstetrician and gynecologist, University of California Hospital; assistant visiting obstetrician and gynecologist, San Francisco Hospital; visiting gynecologist, Laguna Honda Home; aged 48; died, February 7, of acute hemorrhagic pancreatitis.

Caswell C. Turner ✠ Glasgow, Ky.; University of Louisville Medical Department, 1910; president-elect of the Kentucky State Medical Association; served as president and secretary of the Barren County Medical Society and for two terms as the councilor of the Third District; during World War I served as a captain in the medical corps of the U. S. Army; in charge of internal medicine at the Samson Community Hospital; a member of the board of the Glasgow Library Association and chairman of the Barren County Board of Health; aged 59; died suddenly, February 28, of angina pectoris.

Samuel Stanley Dorrance, Albany, N. Y.; Albany Medical College, 1938; Dazian Fellow in medical research, Johns Hopkins University, 1941-1942; served as assistant professor of physiology and pharmacology and associate in medicine, Albany Medical College; since September 1942 employed by the Transcontinental and Western Air, Inc., as a flight surgeon for a contract carrier operating under the Army Air Transport Command; aged 30; was killed in an air transport crash, January 15, in Dutch Guiana while on his way to conduct a medical survey in South America and Africa.

Willard Geist Mengel ✠ Camden, N. J.; University of Pennsylvania School of Medicine, Philadelphia, 1921; assistant professor of ophthalmology at the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania, Philadelphia; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology; for many years on the staff of the Wills Hospital, Philadelphia; ophthalmologist on the staff of the Camden County General Hospital, Grenloch; aged 46; died, January 7, of coronary occlusion.

Francis Normer Andrews, Branchville, S. C.; Medical College of the State of South Carolina, Charleston, 1925; member of the Medical Society of the State of North Carolina; served during World War I; aged 43; was killed, January 19, when his automobile overturned.

William A. Applegate, Washington, D. C.; Harvard Medical School, Boston, 1882; in 1937 retired as chief surgeon of the Southern Railroad after holding the position for thirty-two years; aged 85; died, December 18.

Eugene Hiram Ash, Canton, Mo.; Fort Wayne (Ind.) College of Medicine, 1901; aged 70; died, December 5, in Iowa City of hemorrhage of the stomach.

Willis Alonzo Bird, Headland, Ala.; Chattanooga (Tenn.) Medical College, 1895; aged 76; died, January 12.

Daniel Heister Bradley, Pitman, N. J.; Hahnemann Medical College of Philadelphia, 1872; aged 93; died, January 30, of senility.

Arthur Richard Braunlich, New York; College of Physicians and Surgeons, New York, 1894; formerly associated with the department of health as a diagnostician and consulting physician at the City Hospital; for many years attending physician on the staff of the Riverside Hospital, the Willard Parker Hospital and St. Francis' Hospital, where he died, January 8, aged 74.

Daniel William Collins, Wilkes-Barre, Pa.; College of Physicians and Surgeons, New York, 1888; aged 76; died, January 8.

William Wilder Cook, Quincy, Mass.; Tufts College Medical School, Boston, 1910; practiced at Maracaibo, Venezuela, and in the Panama Canal Zone for many years; aged 56; died, January 23, of coronary occlusion.

William E. Crutcher, Fort Myers, Fla.; University of Louisville (Ky.) Medical Department, 1891; aged 77; died, January 4, of heart disease, nephritis and hypertension.

Alan Morgan Davis, Portland, Ore.; University of Oregon Medical School, Portland, 1938; a first lieutenant in the medical reserve corps of the U. S. Army not on active duty; aged 29; died, December 18, in San Francisco of Hodgkin's disease.

Theodore Benjamin Davis, Newnan, Ga.; College of Physicians and Surgeons, Baltimore, 1881; aged 85; died recently.

Wayland Whitten Deering, Shenandoah, Iowa; Eclectic Medical Institute, Cincinnati, 1898; aged 70; died recently of coronary thrombosis.

Thomas Sewell Fuson, Cumberland Gap, Tenn.; Hospital College of Medicine, Louisville, Ky., 1906; served during World War I; aged 65; died, February 13, as the result of a cerebral hemorrhage which occurred in September 1942.

Henry Walter Gilley, Ottawa, Kan.; Detroit Homeopathic Medical College, 1872; member of the Kansas Medical Society; served on the staff of the Ransom Memorial Hospital; aged 92; died, November 18.

Thomas Edward Griffiths ✠ Chicago; Chicago Medical School, 1921; served with the Scottish Highlanders during the Boer War; physician for Armour and Company's Thirty-First Street Auxiliary; aged 57; died, January 6, in St. Luke's Hospital of acute coronary thrombosis.

Lewis Scott Hay, Rock Hill, S. C.; Medical College of the State of South Carolina, Charleston, 1910; member of the South Carolina Medical Association; served as a first lieutenant in the U. S. Navy Air Corps during World War I; member of the staffs of the York County and St. Philip's Mercy hospitals; aged 55; died, January 22, in the Veterans Administration Facility, Oteen, of pulmonary tuberculosis.

Holm Holmson, Anaheim, Calif.; Rush Medical College, Chicago, 1906; aged 69; died, December 24, in the Queen of Angels Hospital, Los Angeles, of internal hemorrhage as the result of an automobile accident.

Julius Jungmann, New York; College of Physicians and Surgeons, New York, 1895; aged 90; died, December 31.

Michael Bernard Kelly, Wheeling, W. Va.; College of Physicians and Surgeons, Baltimore, 1903; member of the West Virginia State Medical Association; fellow of the American College of Surgeons; past president of the Ohio County Medical Society; served on the staff of Wheeling Hospital; served during World War I; aged 70; died, December 10, in Charleston.

Martin N. Lehmayer, York, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1886; president of the Pennsylvania Tool and Manufacturing Company; formerly director of the Farmers Bank and Guardian Trust Company; aged 78; died, December 11.

John Joseph Maney, Lawrence, Mass.; Baltimore Medical College, 1900; aged 67; died, December 11, in the Burke Memorial Hospital of chronic myocarditis.

Robert Mann, Memphis, Tenn.; Memphis Hospital Medical College, 1904; member of the Tennessee State Medical Association; on the staff of the Baptist Memorial Hospital; aged 62; died, January 1.

Charles Bradford Mayberry, Wayne, Pa.; Harvard Medical School, Boston, 1887; member of the Medical Society of the State of Pennsylvania and the American Psychiatric Association; formerly physician in charge of the Hospital for Insane, Retreat; aged 80; died, December 27, in the Bryn Mawr (Pa.) Hospital of pulmonary edema.

Alexander Murray, Lord's Cove, N. B., Canada; Jefferson Medical College of Philadelphia, 1892; Northwestern University Medical School, Chicago, 1893; aged 84; died in December.

James T. Musselman, Paris, Ill.; Louisville (Ky.) Medical College, 1879; member of the Illinois State Medical Society; past president of the Aesculapian Society of Wabash County; for many years director of the First National Bank; surgeon for the New York Central Railroad for fifty-nine years; a member of the first pension board of Edgar County; aged 88; died, December 17.

Harlan Forest Nelson, Brooten, Minn.; University of Minnesota Medical School, Minneapolis, 1935; aged 35; died, December 6, in an automobile accident.

John Adna Peterson, Hingham, Mass.; University of Vermont College of Medicine, Burlington, 1896; formerly a medical examiner of the Fifth Plymouth District; aged 72; died, December 26.

John Plunkett, Freeport, N. Y.; University of the City of New York Medical Department, New York, 1892; aged 82; died, December 21.

James R. Priest, Houston, Miss.; Memphis (Tenn.) Hospital Medical College, 1903; member of the Mississippi State Medical Association; aged 65; died, December 5.

Edmund Houghton Sawyer ✠ Pasadena, Calif.; Harvard Medical School, Boston, 1908; aged 61; died recently in San Francisco of rheumatic heart disease.

John Henry Stidham, Safford, Ariz.; College of Physicians and Surgeons, Little Rock, 1910; served during World War I; aged 65; died, December 26, in the Morris-Squibb Hospital of injuries received in an automobile accident.

Charles Samuel Strahan, Galesburg, Kan. (licensed in Kansas in 1908); aged 81; died, December 12, of heart disease.

Albert E. Swartz, Chicago; College of Physicians and Surgeons of Chicago, 1895; formerly a school doctor; aged 67; died, February 4, in the Wesley Memorial Hospital of lobar pneumonia and uremia.

Charles Abram Van der Beek, Rochester, N. Y.; University of the City of New York Medical Department, New York, 1889; member of the Medical Society of the State of New York; aged 79; died, December 15, in the Genesee Hospital.

Lilian Barbara M. Yeomans, Manhattan Beach, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1882; aged 81; died, December 9, of arteriosclerosis and heart block.

DIED WHILE IN MILITARY SERVICE

Joseph Lewis Stettauer, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1901; member of the Illinois State Medical Society; commandant of the aviation cadet examining board at Winston-Salem, N. C.; began active service in February 1941 as a lieutenant colonel in the U. S. Army and was a medical inspector of the thirty-third division at Camp Forrest, Tenn.; at one time a captain of the 108th medical regiment of the thirty-third division of the Illinois National Guard; for two years served as chief of the staff of the Rotunda Lying-In Hospital, Dublin, Ireland; served on the staffs of the Jackson Park Hospital and St. Luke's Hospital, where he died, January 3, while on a ten day leave, of acute coronary thrombosis, aged 60.

Harry Charles Nash ✠ University Heights, Ohio; Western Reserve University School of Medicine, Cleveland, 1922; had been senior assistant visiting surgeon at the St. Vincent Charity Hospital, Cleveland; began active duty as a captain in the medical corps of the United States Army Air Forces in September 1942; aged 45; stationed at Teague, Texas, where he died, January 3, of coronary disease.

Correspondence

EVOLUTION OF OUR KNOWLEDGE OF TUBERCULOSIS

To the Editor:—In an editorial in The Journal, Nov. 18, 1939, on the "Evolution of Our Knowledge of Tuberculosis" there appears the following: "It is said that William Stark, who was studying the pathology of phthisis in London under the renowned John Hunter, died of tuberculosis as the result of a wound received in the morgue. Baillie, the successor of Stark, also developed an infection of the hand after performing a necropsy and died of tuberculosis, but not until his years of study had clarified the knowledge of the tubercle."

I have been unable to find this story about William Stark, although I have consulted the Dictionary of National Biography, Smyth's Introduction to Stark's work, 1788, and the account of his illness and death in the same volume. Also I am unable to find any connection between Baillie's infection of the hand from a slight wound while dissecting a putrid body and his death many years after of the "consumption."

Can you tell me where this information can be obtained? I have read a number of lives of Mathew Baillie, including that of James Wardrop, and find it hard to explain how Baillie, born in 1761, became Stark's successor, Stark having died in 1770. Mathew Baillie worked under William Hunter, so that I am quite confused. Could you give me the sources for these observations?

W. L. Holman, M.D., Toronto.

Comment.—The questions raised were sent to Dr. Lewis J. Moorman, on whose paper in the *Journal of the Oklahoma State Medical Association* of June 1939, page 204, the editorial was based.

"The story about William Stark appears in Dr. Lawrence F. Flick's 'Development of Our Knowledge of Tuberculosis,' published by the Wickersham Printing Company, Lancaster, Pa., in 1925, p. 190. With reference to the statement that Mathew Baillie was Stark's successor, may I call attention to the fact that in my original article I merely state that 'Mathew Baillie, having recently graduated in medicine, received an appointment in St. George's Hospital to work in the autopsy room where Stark had received his fatal infection. No doubt Baillie was inspired by the work of young Stark and sought the opportunity of pursuing the latter's pathological researches under his famous uncle, John Hunter.' This does not necessarily imply that Baillie was Stark's immediate successor. Flick points out the fact that Baillie followed his postmortem studies at St. George's Hospital for eighteen years. John Hunter received his appointment at St. George's Hospital in 1768 and was on duty at St. George's when he died in 1793.

"Referring to the question about Baillie's autopsy wound, I again quote from the original article which gave rise to the editorial: 'He [Baillie] also received an infection of the hand while performing an autopsy but died of advanced pulmonary tuberculosis at the age of 62.' This may be misleading, but the author did not mean to imply that the advanced tuberculosis had any relationship to the autopsy wound.

"My information with reference to John Hunter and his brother William came chiefly from Benjamin Hutchinson's 'Biographia Medica,' published in 1799. Even though Baillie worked with William Hunter, it is my impression that he and Stark both pursued their pathologic studies under Dr. John Hunter."—Ed.

VACCINATION AGAINST SMALLPOX

To the Editor:—During the recent outbreak of smallpox in Pennsylvania, mass prophylactic cowpox vaccination was begun in Philadelphia. I myself have had the unpleasant experience of having additional vaccinations on both thumbs, which are requiring surgical attention besides that self inoculated on my left arm. In view of this experience I think it advisable to offer the following suggestions to prevent such occurrences in other physicians who may be called on to carry out inoculations on a large scale:

1. Adhesive strip tapes on the tips of the fingers, particularly the thumb and index finger of both hands.

2. The use of full rubber gloves or finger cots, which are inexpensive. Should the rubber tear, additional protection will be had by the under covering adhesive tape. Rubber protection is advised in order to prevent alcoholic dehydration of the skin of the finger tips with subsequent fissuring, which renders accidental inoculation and secondary infection more likely.

3. The absolute mark filing of the glass enclosed vaccine and needle tubes. This is done in order to prevent glass splintering. Despite the fact that the biologic brochures advise only simple finger breaking of the glass tubes, the foregoing is advisable. Breaking of the glass tubes in gauze or cotton is an added precaution.

In addition, in order to save vaccine, two or three inoculations might be obtained from one tube. I might add that other physicians and assistants have had such occurrences and I trust that my experience will be of help in preventing these.

Philip R. Trommer, M.D., Philadelphia.

COOLING IN SHOCK

To the Editor:—I was interested in the editorial on cooling in shock (The Journal, February 6, p. 432). My own thoughts have been similar to those which you express. I think you will be interested to hear of observations told me by a nurse with a British surgical unit in loyalist Spain during the war there. She said that they were up front in two heavy attacks, one in the mountains in the winter and one in the dry plains in the summer. Troops, diets and injuries were comparable. That the degree of shock, especially for lesser injuries, was so much greater in the summer fighting, with repeated fatalities from minor wounds, was the subject of repeated and prolonged staff conferences, without reaching any conclusions. Under war conditions dehydration complicates the analysis of the effect of temperature alone. According to her description, the temperature contrasts were pronounced, as both cold and heat were intense.

Isabella H. Perry, M.D.,
University of California Medical School,
San Francisco.

CONTINUOUS CAUDAL ANALGESIA IN OBSTETRICS

To the Editor:—There has been misunderstanding regarding the cost of "continuous caudal anesthesia for painless childbirth" proposed by Hingson and Edwards. Comment by radio, magazine and newspaper reviewers contains the statement "Cost of the new method, it is estimated, should average about $3 per patient." This "cost" refers only to cost of materials and not average charge which will be made for the administration of continuous caudal anesthesia.

Paul M. Wood, M.D., New York.
Secretary, American Society of Anesthetists.

Council on Medical Education and Hospitals

CONTINUATION COURSES FOR PRACTICING PHYSICIANS

In accordance with the plan of the Council on Medical Education and Hospitals, advance information concerning continuation courses for practicing physicians available in the various centers is published quarterly. The following list consists of courses beginning during the period April 1, 1943-June 30, 1943. It is hoped that this material will be useful to physicians seeking opportunities for postgraduate work. Physicians called on to assume new responsibilities because of the war and physicians who are returning to practice may find here listed courses which will be of help to them. Since many of the classes are necessarily limited, those who contemplate enrolling in any of these courses are urged to communicate as early as possible with the proper executive officer.

H. G. WEISKOTTEN, M.D.
Secretary, Council on Medical
Education and Hospitals.

Continuation Courses for Practicing Physicians—April 1, 1943-June 30, 1943

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
ALLERGY—See also Dermatology & Syphilology				
American College of Physicians, 4200 Pine Street, Philadelphia, Pa. Write to: E. R. Loveland, Executive Secretary	April, 1943. 2 weeks, full time	Allergy	Limited [10]	.....
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	March 29-April 16, 1943.[28] Full time	General Course	4-8	$150 [24]
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia, Pa. Write to: Dr. R. C. Buerki, Dean, The Medico-Chirurgical College	Arranged. 4 weeks, about 40 hours	Allergy	Individuals [3]	$150
Drs. Vaughan and Graham, 201 West Franklin Street, Richmond, Va. Write to: Dr. Warren T. Vaughan	1 year course; every 6 months	Training in Allergy	Limited	.....
ANATOMY—See also Otolaryngology; Surgery				
New York Medical College, Flower and Fifth Avenue Hospitals, 5th Avenue at 105th Street, New York City. Write to: Dr. J. A. W. Hetrick, Dean	Arranged. 60 hours	Applied Anatomy of Ear, Nose and Throat	....	$150 [17]
	Arranged. 90 hours	Applied Anatomy of Pelvis and Abdomen	....	$250
	Arranged. 60 hours	Applied Anatomy of the Urogenital System	....	$150 [17]
	Arranged. 100 hours	Surgical Anatomy	....	$250
ANESTHESIOLOGY				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	Arranged. 12 sessions	Regional Anesthesia	2-4 [3]	$75 [24]
	Continuously. 2 weeks	Anesthesia	1 [3]	$50 [24]
Harvard Medical School, 25 Shattuck Street, Boston, Mass. Write to: Dr. Frank R. Ober Assistant Dean, Courses for Graduates	Monthly. Days and hours arranged	Clinical Anesthesia	3	$30
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York City. Write to: Dr. F. H. Dillingham, Executive Officer	April 1-June 30, Full time.	Regional and Spinal Anesthesia	4	$300 [24]
New York University College of Medicine, 477 First Avenue, New York City. Write to: Dr. John H. Mulholland, Assistant Dean	Arranged. Part time for 3 weeks	Inhalation Anesthesia	5	$150
	Arranged. Part time for 3 weeks	Regional Anesthesia	....	$200
BACTERIOLOGY—See also Ophthalmology; Otolaryngology; Pathology; Public Health				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	April.[28, 29] 1 month, part time	Bacteriological Service in Medicine and Surgery	5-20	$35 [24]
	May.[28, 29] 1 month, full time	Practical Technique of Medical Bacteriology	2	$100 [24]
BIOCHEMISTRY				
Harvard Medical School, 25 Shattuck Street, Boston, Mass. Write to: Dr. Frank R. Ober, Assistant Dean, Courses for Graduates	Arranged	Research in Biological Chemistry	....	Arranged [14]
BRONCHOSCOPY—See Otolaryngology				
CANCER				
Tufts College Medical School, 30 Bennet Street, Boston, Mass. Write to: Dr. Samuel Proger, Chairman, Postgraduate Division	On request	Cancer	Minimum: 4	Arranged [14]
United States Public Health Service: National Cancer Institute at approved institutions. Write to: Surgeon General, Washington, D. C.	Arranged. Full time	Diagnosis and Treatment	Individuals	Varies [25, 26]
CARDIOLOGY				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	2 months, weekly class beginning April 5	Cardiology	4-15	$35
	3 weeks in June	Cardiovascular Diseases	Minimum: 4	$75
	April.[28, 29] 4 weeks, part time	Electrocardiography	Minimum: 4	$50 [24]
	May.[28, 29] Full time	Advanced Electrocardiography	Minimum: 3	$50 [24]
Columbia University, Faculty of Medicine, 630 West 168th Street, New York City, at Mount Sinai Hospital. Write to: Dean	April 5-May 1.[28] Full time	Intensive Course in Cardiovascular Diseases	Minimum: 10	$100
New York Medical College, Flower and Fifth Avenue Hospitals, 5th Avenue at 105th Street, New York City. Write to: Dr. J. A. W. Hetrick, Dean	Arranged. 16 semi-weekly sessions	Cardiology and Electrocardiography	....	$100
New York State Department of Health, Cardiac Service. Write to: New York State Reconstruction Home, West Haverstraw, N. Y.	Arranged. 3 months	Rheumatic Cardiac Disease	Limited [1]	None [28]
Tufts College Medical School, 30 Bennett Street, Boston, Mass. Write to: Dr. Samuel Proger, Chairman, Postgraduate Division	May 10-14	Electrocardiography	....	$25 [14]
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia, Pa. Write to: Dr. R. C. Buerki, Dean, The Medico-Chirurgical College	Weekly. 5 days, about 30 hours	Electrocardiology and Cardiac Roentgenology	Individuals [3]	$60
CYSTOSCOPY—See Obstetrics & Gynecology; Urology				

References will be found on p. 974

Continuation Courses for Practicing Physicians—April 1, 1943–June 30, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
DERMATOLOGY & SYPHILOLOGY—See also Obstetrics & Gynecology; Public Health; Venereal Disease Control				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	Arranged. 6 weeks or 3 months, part time	Clinical Dermatology and Syphilology	20	$40, $75 [24]
	Arranged. 6 weeks or 3 months, part time	Practical Instruction in the Diagnosis and Management of Syphilis	3	$40; $75
	Arranged. 6 weeks or 3 months, part time	Diagnosis and Treatment of Syphilis	6	$25;$40 [24]
	Arranged. 6 weeks or 3 months, part time	Practical Instruction in Physical Therapy as Applied to Diseases of the Skin	3	$40; $75 [24]
	Arranged. 6 weeks or 3 months, part time	Practical Instruction in Dermatological Allergy and Immunology	3 [2]	$40; $75 [24]
	Arranged. 3 or 6 months or 1 year, part time	Practical Instruction in the Pathological Histology of Diseases of the Skin	12 [2]	$75;$125;$175 [24]
	Arranged. 6 weeks or 3 months, part time	Practical Instruction in Mycology and Animal Parasitology as Related to Diseases of the Skin	3 [2]	$40; $75 [24]
	Arranged. 6 weeks or 3 months, part time	Practical Instruction in Minor Dermatological Surgery	2 [2]	$40; $75 [24]
	May 3-8.[29] Full time	Seminar in Practical Dermatology and Syphilology for General Practitioners	Minimum: 12	$35 [24]
Harvard Medical School, 25 Shattuck Street, Boston, Mass. Write to: Dr. Frank R. Ober, Assistant Dean, Courses for Graduates	Monthly. 1 month, part time	Dermatology	....	$40
	Arranged. Full time	Skin Ward Work	Limited [3]	Arranged
	Arranged. Part time for 2 months	Clinical Mycology	6	$50
	May.[29] Part time, 1 month	Occupational Dermatoses	....	$40
	April. 1 year, full time	Dermatology and Syphilology	Limited [3,13]	$300
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York City. Write to: Dr. F. H. Dillingham, Executive Officer	First of any month, 6 weeks, 3 months, part time	Dermatology and Syphilology	....	$50; $75
Tufts College Medical School, 30 Bennet Street, Boston, Mass. Write to: Dr. Samuel Proger, Chairman, Postgraduate Division	May 17-22. Full time	Diagnosis and Therapy of the Commoner Diseases of the Skin	Minimum: 6	$25 [24]
DIETETICS				
Tufts College Medical School, 30 Bennet Street, Boston, Mass. Write to: Dr. Samuel Proger, Chairman, Postgraduate Division	On request	Dietetics	Minimum: 4	Arranged [14]
ELECTROCARDIOGRAPHY—See Cardiology				
ENDOCRINOLOGY—See also Medicine; Obstetrics & Gynecology				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	Once weekly; 2 months; Begins April 5	Diseases of the Thyroid and Other Endocrine Glands, and Nutrition	Minimum: 4	$35
Tufts College Medical School, 30 Bennet Street, Boston, Mass. Write to: Dr. Samuel Proger, Chairman, Postgraduate Division	May 24-28. Full time	Recent Advances in Endocrinology	....	$25 [14]
ENDOSCOPY—See Obstetrics & Gynecology; Surgery				
EPIDEMIOLOGY—See Military Medicine; Public Health				
FORENSIC MEDICINE				
New York University College of Medicine, 477 First Avenue, New York City. Write to: Dr. John H. Mulholland, Assistant Dean	Oct.-May. 1-7 months, part time	Forensic Medicine	....	$25; $100
GASTROENTEROLOGY—See also Proctology				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	Once weekly; 2 months. Begins April 5	Gastroenterology	4-15	$35
	May 5-July 21. Part time	Gastroscopy	1-4	$75
Columbia University, Faculty of Medicine, 630 West 168th Street, New York City, at Mount Sinai Hospital. Write to: Dean	April 5-May 1.[28] Full time	Relation of Gastroenterology to Internal Medicine and Abdominal Surgery	Minimum: 10	$100
Columbia University, Faculty of Medicine, 630 West 168th Street, New York City, at Presbyterian Hospital. Write to: Dean	Arranged. 2 months, part time	Gastroscopy	1 [2]	$200
Hahnemann Medical College and Hospital, 230 North Broad Street, Philadelphia, Pa. Write to: Dr. William A. Pearson, Dean	Monthly. 1 month, full time	Gastroscopy	2	$200
New York Medical College, Flower and Fifth Avenue Hospitals, 5th Avenue at 105th Street, New York City. Write to: Dr. J. A. W. Hetrick, Dean	Arranged. 10 sessions	Gastroscopy	....	$100 [18]
	Arranged. 5 sessions	Peritoneoscopy	....	$50 [18]
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York City. Write to: Dr. F. H. Dillingham, Executive Officer	April 1.[29] 3 months	Clinical Gastroenterology	10	$50 [24]
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia, Pa. Write to: Dr. R. C. Buerki, Dean, The Medico-Chirurgical College	Arranged. 16 weeks, part time	Clinical Course	Individuals [3]	$100
GASTROSCOPY—See Gastroenterology; Otolaryngology				
GYNECOLOGY—See Obstetrics and Gynecology				
HEMATOLOGY—See also Medicine				
New York Medical College, Flower and Fifth Avenue Hospitals, 5th Avenue at 105th Street, New York City. Write to: Dr. J. A. W. Hetrick, Dean	Arranged. 8 weeks, part time	Physical Diagnosis and Hematology	....	$100
INFANTILE PARALYSIS				
University of Minnesota Medical School, Minneapolis, Minn. Write to: Dr. Harold S. Diehl, Dean	Arranged.[29] 6 days, full time	Kenny Treatment of Acute Poliomyelitis	25 [24]	$25
INDUSTRIAL MEDICINE				
National Conference of Government Hygienists, Rochester, N. Y. Write to: Dr. Wm. A. Sawyer, Chairman, 343 State St., Rochester, N. Y.	May 24-27. Full time	War Conference	....	None
LARYNGOLOGY—See Otolaryngology				
MEDICINE				
American College of Physicians, 4200 Pine Street, Philadelphia, Pa., at Boston. Write to: E. R. Loveland, Executive Secretary	April. 2 weeks, full time	General Medicine	Limited [10]	.....
American College of Physicians, 4200 Pine Street, Philadelphia, Pa. Write to: E. R. Loveland, Executive Secretary	April. 2 weeks, full time	Internal Medicine	Limited [10]	.....
American College of Surgeons, 40 Erie Street, Chicago, Ill., at Boston. Write to: Dr. Bowman C. Crowell, Director	April 5-10. Full time	Internal Medicine	25-60	$20 [21]

References will be found on p. 974

Continuation Courses for Practicing Physicians—April 1, 1943–June 30, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
MEDICINE—(Continued)				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	April 5. 2 months, full time	Internal Medicine	....	$200
	April 5. 1 or 2 months, full time	Seminar in Internal Medicine	4-10	$125; $200 [24]
	April 5. Once a week, 2 months	Arthritis and Allied Rheumatic Disorders	Minimum: 4	$35
	April 5. Once a week, 2 months	Clinical Interpretations of Laboratory Data	Minimum: 4	$25
	April 5. Once a week, 2 months	Problems in Diagnosis	4-10	$35
	April 5. Once a week, 2 months	Acute and Chronic Diseases of the Chest	4-15	$35
	April 5. Once a week, 2 months	Diseases of the Liver and Biliary Tract	Minimum: 4	$25
	April 5. Once a week, 2 months	Diseases of the Spleen and Clinical Hematology	Minimum: 4	$20
	April 5. Once a week, 2 months	Diabetes Mellitus, Nephritis and Hypertension	Minimum: 4	$35
	April 5. Once a week, 2 months	Psychologic Aspects of Internal Medicine	Minimum: 4	$25
	April 5. Once a week, 2 months	Peripheral Vascular Diseases	4-15	$25
	May 17-28. Full time	Recent Developments in Diagnostic Procedures	4-10	$50
	June. 5 days, full time	Diseases of the Liver and Biliary Tract	Minimum: 4	$35
	June. 5 days, full time	Clinical Interpretations of Laboratory Data	Minimum: 4	$35
Florida Medical Association, Inc. Write to: Dr. T. Z. Cason, Chairman, Medical Postgraduate Course, 2033 Riverside Avenue, Jacksonville, Fla.	Arranged. 2 weeks or more, full time	General Medicine	10	$5
Harvard Medical School, 25 Shattuck Street, Boston, Mass. Write to: Dr. Frank R. Ober, Assistant Dean, Courses for Graduates	Continuously. Part time	Diabetes	....	None
	April, May. 1-4 months, full time	General Course in Internal Medicine	....	$150
Maine Medical Association, 142 High Street, Portland, Maine. Write to: Dr. Frederick R. Carter, Chairman, Committee on Graduate Education	Arranged. Part time	Home Study Course	Limited [7]	None
New York Medical College, Flower and Fifth Avenue Hospitals, 5th Avenue at 105th Street, New York City. Write to: Dr. J. A. W. Hetrick, Dean	Arranged. 5 weeks, part time	Endocrine and Metabolic Disturbances, including Diabetes Mellitus	....	$100
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York City. Write to: Dr. F. H. Dillingham, Executive Officer	Arranged. 6 weeks, 3 months, full time	Course for General Practitioners	....	$100; $150 [24]
Philadelphia County Medical Society, 301 South 21st Street, Philadelphia, Pa. Write to: Dr. Rufus S. Reeves, Director, Postgraduate Institute	April.[29] Full time	Treatment of Medical Emergencies (8th Annual Postgraduate Institute)	....	$5
Tufts College Medical School, 30 Bennet Street, Boston, Mass. Write to: Dr. Samuel Proger, Chairman, Postgraduate Division	May 3-28. Full time	Internal Medicine	....	$50 [14]
University of Maryland, School of Medicine, Lombard and Green Streets, Baltimore, Md. Write to: Dr. Robert U. Patterson, Dean	Arranged	Subject Optional	Individuals	Arranged
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia, Pa. Write to: Dr. R. C. Buerki, Dean, The Medico-Chirurgical College	Arranged. 2-4 weeks, 75 hours	Diabetes Mellitus	Individuals [2]	$150
MILITARY MEDICINE				
American College of Surgeons, 40 Erie Street, Chicago, Ill. Write to: Dr. Bowman C. Crowell, Director, in 20 centrally located cities	March 1-April 30. 1 day, full time	War Sessions	....	.....
Harvard Medical School, 25 Shattuck Street, Boston, Mass. Write to: Dr. Frank R. Ober, Assistant Dean, Courses for Graduates	To be announced. 2 weeks, full time	Military Medicine and Surgery	Limited [9]	.....
Navy Department, Washington, D. C. Write to: Bureau of Medicine and Surgery	6 times yearly. 8 weeks, full time	Aviation Medicine (Aviation Medical Examiner)	Limited [8]	None
	Every five months. 5 months, full time	Aviation Medicine (Flight Surgeon)	Limited [8]	None
	3 times a year. 8 weeks, full time	Basic Instruction	Limited [8]	None
	Twice yearly. 6 months, full time	Deep Diving	4-12 [8]	None
	Twice yearly. 6 months, full time	Epidemiology	8-20 [8]	None
War Department, Washington, D. C. Write to: Training Division, Office of the Surgeon General, United States Army	Monthly. 170 hours	Basic Course for Officers	500 [8]	None
	Monthly. 1 month, full time	Exemplary Course	158 [8]	None
	Arranged. 1 month, 145 hours	Maxillo-Facial and Plastic Surgery	12 [8]	None
	Arranged. 1-3 months	Officer Pool, 14 General Hospitals	700	None
	Undetermined	Officer Pool, Gulf Coast Air Corps Training Center	200 [8]	None
	Undetermined	Officer Pool, Medical Field Service School	150 [8]	None
	Arranged. 1-3 months	Officer Pool, Medical Replacement Training Centers	200 [8]	None
	Undetermined	Officer Pool, Medical Supply Depots and Medical Sections, General Depots	50 [8]	None
	Arranged. 2 weeks, full time	Photoroentgenology	20 [8]	None
	Monthly. 170 hours	Special Course for Division Officers	100 [8]	None
	Continuously	Specialized Surgical Team Training	Limited [8]	None
NEUROLOGY—See Psychiatry and Neurology				
OBSTETRICS & GYNECOLOGY—See also Pathology				
The Chicago Maternity Center, 1336 South Newberry Avenue, Chicago, Ill. Write to: Dr. Beatrice L. Tucker, Medical Director	May.[29] 4 months	Practical Obstetrics	....	$10

References will be found on p. 974

Continuation Courses for Practicing Physicians—April 1, 1943–June 30, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
OBSTETRICS & GYNECOLOGY—Continued				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	April.[29] 1, 2 or 3 months	Seminar in Gynecology	4-6	$125; $225; $300 [24]
	Arranged. 4 weeks, part time	Diagnosis and Office Treatment (Gynecology)	6	$40; $60 [24]
	Arranged. 5 weeks, part time	Cystoscopy and Endoscopy	6	$75 [24]
	April 5. 1, 2 or 3 months	Gynecology	....	$125; $225; $300 [24]
	Arranged. 8 weeks, part time	Gynecological Endocrinology	4	$100 [24]
	Arranged. 4 weeks or longer, part time	Gynecological Pathology	....	Arranged
	Arranged. 4 weeks, part time	Surgical Anatomy as Applied to Operative Gynecology (Cadaver)	2-3 [3]	$200 [24]
Columbia University, Faculty of Medicine, 630 West 168th Street, New York City, at Margaret Hague Maternity Hospital. Write to: Dean	Monthly. 3 months	Internship Training	....	$350
	Monthly. 1 month	Observation Course in Obstetrics	....	$100
Florida Medical Association, Inc. Write to: Dr. T. Z. Cason, Chairman, Medical Postgraduate Course, 2033 Riverside Avenue, Jacksonville, Fla.	Continuously. 2 weeks or more, full time	Gynecology	5	$5
	Continuously. 2 weeks, or more, full time	Obstetrics	5	$5
Harvard Medical School, 25 Shattuck Street, Boston, Mass. Write to: Dr. Frank R. Ober, Assistant Dean, Courses for Graduates	June.[29] 1 month or more, part time	Gynecology	4 [4]	$75 a month
	Monthly. 1 month or more, full time	Clinical Obstetrics	8 [4]	$125
	Monthly. 10 exercises	Gonorrhea in Women	3	$20
Indiana University Medical Center, 1040-1232 West Michigan Street, Indianapolis, Ind. Write to: Dr. C. J. Clark, Chairman, Department of Postgraduate Instruction	Arranged. 2 weeks, full time	Obstetrics	10	$10 [23]
Louisiana State Board of Health, Maternal and Child Health Service, 213 Civil Courts Bldg., New Orleans, La. Write to: Director	April 12-24; May 31-June 13	Refresher Course in Obstetrics.	Limited	.....
Maine Medical Association, 142 High Street, Portland, Maine. Write to: Dr. Frederick R. Carter, Chairman, Committee on Graduate Education	Arranged	Home Study Course	Limited [7]	None
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York City. Write to: Dr. F. H. Dillingham, Executive Officer	April 1.[29] 2 months, full time	Clinical and Operative Obstetrics and Gynecology	6	$250 [24]
	April 1.[29] 2 months, full time	Obstetrics and Gynecology	Minimum: 2	$250
North Carolina State Board of Health, Raleigh, N. C. Write to: Dr. G. M. Cooper, Director, Maternal and Child Health Service [31]	Weekly, 5 days, full time	Obstetrics and Pediatrics	4-6 [5]	None [25]
Tulane University of Louisiana, School of Medicine, 1430 Tulane Avenue, New Orleans, La. Write to: Dr. H. W. Kostmayer, Director, Department of Graduate Medical Studies	April 19-23, full time	Obstetrics and Gynecology	....	$25
University of Illinois College of Medicine, 1853 West Polk Street, Chicago, Ill. Write to: Mr. George Moon, Assistant to the Dean	Arranged. 2 weeks, full time	Obstetrics and Pediatrics	Limited	None
OPHTHALMOLOGY				
Children's Memorial Hospital, 707 Fullerton Avenue, Chicago, Ill. Write to: Miss Meyer, Secretary.	May.[29] 6 days, full time	Neuro-muscular Anomalies of the Eye	Limited	$50
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	Arranged. 15 sessions [30]	Embryology, Histology and Pathology of the Eye	Limited [2]	$75 [24]
Gill Memorial Eye, Ear and Throat Hospital, 711 South Jefferson Street, Roanoke, Va. Write to: Dr. E. G. Gill, Medical Director	April 6-11, full time	Ophthalmology and Otolaryngology	....	.....
New York Eye and Ear Infirmary, 218 Second Avenue, New York, N. Y. Write to: Mabel R. Stewart, Registrar	Monthly.[28] 1 month, part time	Anomalies of the Ocular Muscles.	8 [1]	$40 [16]
	Monthly.[28] 1 month, part time	Bacteriology of the Eye	4 [1]	$40 [16]
	Monthly.[28] 1 month, part time	External Diseases of the Eye	6 [1]	$40 [16]
	Monthly.[28] 1 month, part time	Ocular Therapy	6 [1]	$40 [16]
	Monthly.[28] 1 month, part time	Operative Surgery of the Eye	4 [2]	$75 [16]
	Monthly.[28] 1 month, part time	Ophthalmoscopy	4 [1]	$40 [16]
	Monthly.[28] 1 month, part time	Perimetry	6 [1]	$40 [16]
	Monthly.[28] 3 months, part time	Physiological Optics	8 [1]	$75 [16]
	Monthly.[28] 3 months, part time	Refraction	8 [1]	$100 [16]
	Monthly.[28] 1 month, part time	Slit Lamp Course	6 [1]	$50 [16]
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York, N. Y. Write to: Dr. F. H. Dillingham, Executive Officer	April.[29] 6 weeks, part time	Clinical Eye Course	10	$50 [24]
	April 1.[29] 6 weeks, part time	Refraction	10	$100
	April 1.[29] 3 months, part time	Ophthalmology Clinics	10	$275
	April 1.[29] 3 months, part time	Operative Course (Cadaver)	10	$275 [24]
Tufts College Medical School, 30 Bennet Street, Boston, Mass. Write to: Dr. Samuel Proger, Chairman, Postgraduate Division	Monthly. 1 month, part time	External Eye Diseases	Limited	$50 [14]
University of Illinois College of Medicine, 1853 West Polk Street, Chicago, Ill. Write to: Mr. George Moon, Assistant to the Dean	April 1.[29] 9 months, part time	Ophthalmology	Limited [1]	$150
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia, Pa. Write to: Dr. R. C. Buerki, Dean, The Medico-Chirurgical College	Arranged. 8 weeks, part time	Ocular Refraction	Individuals [2]	$270
	Arranged. 8 weeks, part time	Ophthalmic Histology and Pathology	Individuals [2]	$200
	Arranged. 2 weeks, part time	Ophthalmic Operations (Cadaver)	Individuals [2]	$270
ORTHOPEDICS—See also Surgery				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	May 3-28.[28, 29] Part time	Orthopedics in General Practice.	10-20	$50 [24]
	May 3-28.[28, 29] Part time	Functional Anatomy in Relation to Orthopedics	6-15	$40 [24]

References will be found on p. 974

Continuation Courses for Practicing Physicians—April 1, 1943–June 30, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
OTOLARYNGOLOGY—See also Ophthalmology				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	Arranged. 4 weeks, or longer, part time	Diagnostic Procedures in Otolaryngology	6	$30 [24]
	Arranged	Dissection of the Head and Neck	Minimum: 2 [2]	Arranged [24]
	Arranged. 15 sessions [30]	Embryology, Histology and Pathology of the Ear, Nose and Throat	Limited [3]	$75 [24]
	Arranged	Surgical Anatomy as Applied to Otology (Cadaver)	2-6 [2]	Arranged [24]
	Arranged	Surgical Anatomy as Applied to Rhinology and Laryngology (Cadaver)	2-6 [2]	Arranged [24]
Columbia University, Faculty of Medicine, 630 West 168th Street, New York, N. Y., at Presbyterian Hospital. Write to: Dean	Arranged. April. 3 weeks	Instruments and Technic of Bronchoscopy	Limited [3]	$250
Gill Memorial Eye, Ear and Throat Hospital, 711 South Jefferson Street, Roanoke, Va. Write to: Dr. E. G. Gill, Medical Director	April 5-10.[29] Full or part time	Spring Graduate Course (Ophthalmology and Otolaryngology))	50 [2]	$50
Harvard Medical School, 25 Shattuck Street, Boston, Mass. Write to: Dr. Frank R. Ober, Assistant Dean, Courses for Graduates	May.[29] 2 weeks, full time	Histopathology of the Nose and Throats	....	$100 [14]
	April.[29] 1 month, full time	All-Day Course	Limited [3,4]	$185 [24]
	April.[29] 1 month, full time	Anatomy and Operative Surgery of the Temporal Bone	Minimum: 6 [3,4]	$150
	Arranged. 2 weeks, full time	Bronchoscopy and Esophagoscopy	Limited [3]	$150
	Monthly. 1 month, full time	Clinical Otology	2 [3]	$50
	Arranged. 2 weeks, full time	Physiology of the Cochlea and Vestibular Apparatus	2	$50
	Arranged	Technique of Submucous Resection of the Nasal Septum	Limited	$75 for 5 exercises
Indiana University Medical Center, 1040-1232 West Michigan Street, Indianapolis, Ind. Write to: Dr. C. J. Clark, Chairman, Department of Postgraduate Instruction	April 12-24	Otorhinolaryngology	....	$150 [44]
New York Eye and Ear Infirmary, 218 Second Avenue, New York City. Write to: Mabel R. Stewart, Registrar	Monthly.[28] 4 weeks, part time	Anatomy of the Ear	4 [1]	$45 [16]
	Monthly.[28] 1 month or more, part time	Bacteriology of the Ear	4 [1]	$40 [16]
	April, May.[28] 2 to 6 weeks, full or part time	Broncho-esophagology	4 [1]	$250 [16]
	Monthly.[28] 1 month, part time	Clinical Otology	4 [1]	$40 [16]
	Monthly.[28] 1 month, part time	Operative Surgery of the Ear and Nasal Accessory Sinuses	4 [1]	$110 [16]
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York City. Write to: Dr. F. H. Dillingham, Executive Officer	April.[29] 3 months, full time	Combined Eye, Ear, Nose and Throat Course	10	$600 [24]
	April.[29] 6 weeks, full time	Clinical Eye, Ear, Nose and Throat Course	10	$100 [24]
	April.[29] 6 weeks, part time	Clinical Ear, Nose and Throat Course	10	$75 [24]
	April.[29] 30 hours	Advanced Otology	4 [2]	$250 [24]
Temple University School of Medicine, 3400 North Broad Street, Philadelphia, Pa. Write to: Prof. Chevalier L. Jackson, Director	April. Full time	Broncho-Esophagology and Gastroscopy	....	$250 [39]
Tufts College Medical School, 30 Bennet Street, Boston, Mass. Write to: Dr. Samuel Proger, Chairman, Postgraduate Division	Monthly. Part time	Otolaryngology	....	$30; $50 [14]
University of Illinois College of Medicine, 1853 West Polk Street, Chicago, Ill. Write to: Mr. George Moon, Assistant to the Dean	April.[29] 9 months, full time	Otolaryngology	Limited [8]	$300
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia, Pa. Write to: Dr. R. C. Buerki, Dean, The Medico-Chirurgical College	Arranged. 2 weeks, full time	Bronchoesophagology, Gastroscopy and Laryngeal Surgery	Individuals [2]	$250
	Arranged. 2 weeks, part time	Otologic Operations (Cadaver)	Individuals [2]	$250
	Arranged. 2 days, part time	Rhinolaryngologic Operations (Cadaver)	Individuals [2]	$150
PATHOLOGY—See also Obstetrics & Gynecology; Ophthalmology; Otolaryngology				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	April, May.[28,29] Part time	Gross and Microscopic Pathology	3-6	$50 [24]
	April-June.[28,29] Part time	Surgical Pathology	3-8 [2]	$125 [24]
Columbia University, Faculty of Medicine, 630 West 168 Street, New York City, at Mount Sinai Hospital. Write to: Dean	April 20-June 25.[28] Part time	Surgical Pathology	Minimum: 4	$45
Harvard Medical School, 25 Shattuck Street, Boston, Mass. Write to: Dr. Frank R. Ober, Assistant Dean, Courses for Graduates	Monthly. Hours arranged	Pathology	4	$40
	Monthly. 1 month, full time	Pathology of Obstetrics and Gynecology [12]	2 [2]	$125
	Arranged	Research in Pathology	....	Arranged [14,15]
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York City. Write to: Dr. F. H. Dillingham, Executive Officer	Arranged	Pathology and Bacteriology (Practical Laboratory Instruction)	....	Arranged [24]
PEDIATRICS—See also Obstetrics & Gynecology				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	April.[28,29] 4 weeks	Seminar in Pediatrics	3-12	$125 [24]
	May, June.[29] 1 month, full time	Clinical Pediatrics	3-5	$100 [24]
	April.[29] 4 weeks, part time	Clinical Pediatrics	3-9	$40 [24]
Florida Medical Association, Inc. Write to: Dr. T. Z. Cason, Chairman, Medical Postgraduate Course, 2033 Riverside Avenue, Jacksonville, Fla.	Continuously. 2 weeks or more, full time	Pediatrics	5	$5
Maine Medical Association, 142 High Street, Portland, Maine. Write to: Dr. Frederick R. Carter, Chairman, Committee on Graduate Education	Arranged	Home Study Course	Limited [7]	None
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York City. Write to: Dr. F. H. Dillingham, Executive Officer	Arranged. 4 weeks, part time	Pediatrics	10	$50
PERITONEOSCOPY—See Gastroenterology				
PHYSIOLOGY—See also Public Health				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York, N. Y. Write to: Director of the School	June 7-11.[28,29] Full time	Pathological Physiology: Functional and Chemical Aspects	Minimum: 4	$35 [24]
Harvard Medical School, 25 Shattuck Street, Boston, Mass. Write to: Dr. Frank R. Ober, Assistant Dean, Courses for Graduates	Arranged	Research in Physiology	....	Arranged [14]

References will be found on p. 974

Continuation Courses for Practicing Physicians—April 1, 1943–June 30, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
PHYSIOTHERAPY				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	April 5-9.[28,29] Full time	General Course	Minimum: 4	$35 [24]
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York City. Write to: Dr. F. H. Dillingham, Executive Officer	April.[29] 4 weeks, part time	General Course	6	$100 [24]
PROCTOLOGY				
New York Polyclinic Medical School and Hospital, 234 West 50th Street, New York City. Write to: Dr. F. H. Dillingham, Executive Officer	April 1. 6 weeks, part time	Clinical Proctology and Gastroenterology	10	$200
	April.[29] 6 weeks, part time	Clinical Proctology, Medical and Operative	10	$75 [24]
	April.[29] 6 or 12 weeks, full time	Combined Course in Proctology, Gastroenterology and Allied Subjects	10	$200 [24]
	April.[29] 10 lessons	Operative Proctology (Cadaver)	10	$200 [24]
	April 1.[29] 5 weeks, part time	Proctology Clinics	10	$75
Tufts College Medical School, 30 Bennet Street, Boston, Mass. Write to: Dr. Samuel Proger, Chairman, Postgraduate Division	April 26-May 1. Full time	Proctology I	....	$25 [14]
	May 3-28. Part time	Proctology II	2 [1]	$100 [14]
PSYCHIATRY & NEUROLOGY				
Boston Psychoanalytic Institute Psychiatry Clinic, 82 Marlborough Street, Boston, Mass. Write to: Director	Arranged	Civilian War Neuroses and Their Treatment	40	None
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	April, May. 1 month or longer	Clinical Neurology	1-6	$50 [24]
	April.[28,29] 4 weeks, full time	Neurology and Psychiatry in General Practice	4-6	$100 [24,34]
Harvard Medical School, 25 Shattuck Street, Boston, Mass. Write to: Dr. Frank R. Ober, Assistant Dean, Courses for Graduates	Arranged	Neuroanatomy, Neurophysiology, Neuropathology, Clinical Neurology or Neurosurgery [27]	....	Arranged
	May-June.[29] 1 month, full time	Neurology	Minimum: 4	$50
	April-May.[29] 6 weeks, part time	Neuropathology	Limited	Arranged [14]
	Arranged	Psychiatry: General Course or Special Fields	Individuals	Arranged
	Arranged	Research in Neuropathology	....	Arranged
Institute for Psychoanalysis, 43 East Ohio Street, Chicago, Ill. Write to: Helen Rose, Administrative Director	On demand. 2 weeks, part time	Clinical Discussions of War Neuroses	50	None
The Menninger Clinic, Topeka, Kansas. Write to: Dr. Karl Menninger, Chief of Staff	Continuously. 12 weeks, part time	Application of Psychoanalysis to the Study of Psychiatric Problems and of the Psychoses	....	$20
	Quarterly. 1 year, full time	Psychoanalytic Instruction	4 [1]	None
	Quarterly. 1 year, full time	Resident Training	4 [1]	None
	Arranged. Full time	Short Courses	....	$100
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia, Pa. Write to: Dr. R. C. Buerki, Dean, The Medico-Chirurgical College	Arranged. 6 weeks or more	Clinical Psychiatry	Individuals [2]	$160
	Arranged. 10 weeks, part time	Clinicobiologic Neurology and Psychiatry	Individuals [11]	$100
PUBLIC HEALTH				
Johns Hopkins University, School of Hygiene and Public Health, 615 North Wolfe Street, Baltimore, Md. Write to: L. J. Reed, Dean	April 15-June 11.[29] Part time	Public Health Laboratory Practice	4 [41]	Arranged
	April 15-June 11.[29] Part time	Chemistry of Metabolism	Limited [41]	Arranged
	April 15-June 11.[29] Part time	Elements of Statistical Analysis	Limited [40,41]	Arranged
	April 15-June 11.[29] Part time	Genetics	Limited [41]	Arranged
	April 15-June 11.[29] Part time	Epidemiology Seminar	Limited [41]	Arranged
	April 15-June 11.[29] Part time	Filterable Viruses: A Study of a Representative Group of Virus Diseases	24 [41]	Arranged
	April 15-June 11.[29] Part time	Exotic Parasitic Diseases	Limited [41]	Arranged
	April 15-June 11.[29] Part time	Malariology	Limited [41]	Arranged
	April 15-June 11.[45] Part time	General Principles of Physiology	Limited [41,42]	Arranged
	April 15-June 11.[29] Part time	Public Health Administration: Field Studies	8 [41]	Arranged
	April 15-June 11.[29] Part time	Public Health Administration: Health Education	Limited [41]	Arranged
	Continuous. 2 months	Advanced Clinical Work in Venereal Disease	Limited [42]	Arranged
	April. 2 months, part time.[29]	Clinical Work in Venereal Diseases	Limited [40]	Arranged
Loyola University School of Medicine, 706 Wolcott Avenue Chicago, Ill. Write to: Miss McGowan, Secretary, Department of Preventive Medicine, Public Health and Bacteriology	Quarterly.[46]	Courses in Administration, Laboratory, Education, Mental Hygiene and Sanitation	Individuals	Arranged
New York State Department of Health, at Albany Medical College, 47 New Scotland Avenue, Albany, N. Y. Write to: Extension Course Office, Albany Medical College	Arranged. 1 year	Extension Course in Public Health	Limited [5]	$40
University of Minnesota Medical School, Minneapolis, Minn. Write to: Dr. Harold S. Diehl, Dean	June.[29] 3 months, part time	Bacteriology: Public Health	....	.....
	March 28-June 12.[29]	Epidemiology	....	.....
	March 28-June 12.[29]	Food Sanitation	....	.....
	March 28-June 12.[29]	Public Health Administration Problems	....	.....
RADIOLOGY—See also Cardiology; Military Medicine				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	March 28-June 18.[28,29] Full time	Basic Diagnostic Roentgenology and Technique	4-8 [2]	$250 [24]
Columbia University, Faculty of Medicine, 630 West 168th Street, New York City, at Mount Sinai Hospital. Write to: Dean	March 29-June 18.	Basic Diagnostic Roentgenology and Technique	Limited [1]	.....
	March 29-June 18.	Clinical Radiation Therapy	Limited [1]	.....

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Continuation Courses for Practicing Physicians—April 1, 1943-June 30, 1943—Continued

Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
RADIOLOGY—Continued				
Columbia University, Faculty of Medicine, 630 West 168th Street, New York City, at affiliated hospitals. Write to: Dean	March 29-June 18.[28] Full time	Clinical Radiation Therapy.....	4-8[2]	$250
Harvard Medical School, 25 Shattuck Street, Boston, Mass. Write to: Dr. Frank R. Ober, Assistant Dean, Courses for Graduates	Monthly. 1 month, full time	General Roentgenology	3[4]	$100
	Monthly. 1 month, full time	General Roentgenology	2[1]	$100
	Monthly. 1 month, full time	General Roentgenology	Limited[1]	$50
	April.[29] 12 exercises	Radiological Physics	....	$10
	Monthly. 1 month, part time	Roentgenology in Diseases of the Eye, Ear, and Accessory Sinuses	3	$35
New York Eye and Ear Infirmary, 218 Second Avenue, New York City. Write to: Mabel R. Stewart, Registrar	Monthly.[25] 6 weeks, part time	Ophthalmic and Otologic Roentgenology	Limited[1]	$40[24]
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York City. Write to: Dr. F. H. Dillingham, Executive Officer	Monthly. 6 weeks or 3 months, full time	Diagnostic Roentgenology and Radiotherapy (Advanced)	10[2]	$150; $300[24]
RHINOLOGY—See Otolaryngology				
SURGERY—See also Anatomy; Military Medicine; Obstetrics & Gynecology; Ophthalmology; Otolaryngology; Pathology				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	Arranged. 8 sessions	Blood Transfusion; Blood and Plasma Bank	1-8	$35[24]
	June.[28,29]	Diagnosis and Treatment of Trauma	5-30	$35[24]
	Arranged. 12 sessions	Dissection and Surgical Anatomy	Minimum: 2[2]	$125[24]
	April 5.[28,29] 6 weeks or 3 months, full time	Seminar in General Surgery	8	$200; $400[24,34]
	April 26-May 7.[28,29] Full time	Seminar in Traumatic Surgery	5-30[2]	$75[24]
	Arranged. 5 sessions	Surgical Anatomy as Applied to Colon and Rectal Surgery (Cadaver)	2	$75
	Arranged. 12 sessions	Surgical Anatomy as Applied to Thoracic Surgery (Cadaver)	2-6[2]	$125[24]
Florida Medical Association, Inc. Write to: Dr. T. Z. Cason, Chairman, Medical Postgraduate Course, 2033 Riverside Avenue, Jacksonville, Fla.	Continuously. 2 weeks or more, full time	Orthopedic Surgery	10	$5
Harvard Medical School, 25 Shattuck Street, Boston, Mass. Write to: Dr. Frank R. Ober, Assistant Dean, Courses for Graduates	Monthly. 1 month, part time	Clinical Orthopedic Surgery.....	1 or more	$50
	Monthly. Hours arranged	Endoscopy	2	Arranged
	May.[29] 1 month, part time	General Surgery of Children....	Limited	$50
	April-June.[29] 1 month or more, part time	Genito-Urinary Surgery	4[4]	$75 per month
	Arranged. 1 month, full time	Minor Surgery, Designed for Practitioners	Minimum: 8	$150
	May.[29] 2 weeks, full time	Plastic Surgery	Limited[2]	$150
	June.[29] 2 weeks, full time	Surgical Technique	38[1]	$200
Maine Medical Association, 142 High Street, Portland, Maine. Write to: Dr. Frederick R. Carter, Chairman, Committee on Graduate Education	Arranged	Home Study Course.....	Limited[7]	None
New York Medical College, Flower and Fifth Avenue Hospitals, 5th Avenue at 105th Street, New York City. Write to: Dr. J. A. W. Hetrick, Dean	Arranged. 60 hours	Surgical Technique (Dog).....	....	$250[17]
New York Polyclinic Medical School and Hospital, 345 West 50th Street, New York City. Write to: Dr. F. H. Dillingham, Executive Officer	April.[29] 3 months, full time	Combined Surgical Course.....	10[2]	$350[24]
	April.[29] 6 weeks, full time	Operative Clinic and Lecture Course	10	$100[24]
	May.[29] 4 weeks, full time	Plastic Reparative Surgery.....	10	$250[24]
Tufts College Medical School, 30 Bennet Street, Boston, Mass. Write to: Dr. Samuel Proger, Chairman, Postgraduate Division	May 3-15. Full time	Applied Surgical Anatomy (Cadaver)	Limited	$175[14]
SYPHILOLOGY—See Dermatology & Syphilology				
TROPICAL MEDICINE				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	May 24-28	Tropical Medicine	Minimum: 4	$50
TUBERCULOSIS				
California Tuberculosis Association, 45 Second Street, San Francisco, Calif. Write to: Mr. Wm. F. Higby, Secretary	April.[29] 3 days, full time	Graduate Assembly	....	None
	Arranged. 1 week	Tuberculosis	Individuals	None[28]
City of Chicago Municipal Tuberculosis Sanitarium, 2049 Washington Blvd., Chicago, Ill. Write to: Department of Clinics	On request. 2 months, part time	Comprehensive Course in Tuberculosis	Minimum: 20	None
	Continuously. Part time	Tuberculosis	....	None
Mississippi State Sanatorium, Sanatorium, Miss. Write to: Dr. Henry Boswell, Supt.	Arranged. 2 weeks or more	Clinical Medicine and Chest Diseases	....	None
New York Medical College, Flower and 5th Avenue Hospitals, 5th Avenue at 105th Street, New York City. Write to: Dr. J. A. W. Hetrick, Dean	Arranged. 1 month, full time	Diagnosis and Treatment.....	....	$100
UROLOGY—See also Surgery				
Columbia University, Faculty of Medicine, at the New York Postgraduate Medical School, 305 East 20th Street, New York City. Write to: Director of the School	Arranged	Short Courses in Special Subjects	Individuals[2]	Arranged[24]
Harvard Medical School, 25 Shattuck Street, Boston, Mass. Write to: Dr. Frank R. Ober, Assistant Dean, Courses for Graduates	April, May. 1 month or more, full time	Urology	....	$75 per month
Joint Committee on Post-Graduate Education, 1313 Bedford Avenue, Brooklyn, N. Y., at the Long Island College of Medicine. Write to: Dr. Simon R. Blattéis, Chairman	Monthly. 1 month or more, part time	Urology	3	$25 per month
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia, Pa. Write to: Dr. R. C. Buerki, Dean, The Medico-Chirurgical College	Arranged. 6 weeks, part time	Cystoscopy, Chromoureteroscopy and Pyelography	Individuals[2]	$300

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Institution	Schedule of Course	Title of Course	Number of Students Accepted	Registration Fee and/or Tuition
VENEREAL DISEASE CONTROL—See also Public Health				
Institute for the Control of Syphilis, University of Pennsylvania Hospital, 3400 Spruce Street, Philadelphia, Pa. Write to: Dr. John H. Stokes, Director	Arranged. 5 or 10 days	Management of Syphilis and Other Venereal Diseases	....	$25
	Arranged. 1 month or more	Management of Venereal Diseases	Individuals	$50 per month
New York City Department of Health, Bureau of Social Hygiene, 125 Worth Street, New York City. Write to: Dr. Theodore Rosenthal, Director	Continuously	Practical Seminar in the Diagnosis, Treatment and Control of Venereal Disease	....	None
United States Public Health Service Medical Center, Hot Springs National Park, Ark. Write to: Dr. Austin V. Delbert, Medical Officer	4 weeks, full time [29]	Management of Venereal Diseases	30 [35]	None

1. Physicians who have had adequate preliminary training and/or experience.
2. Specialists.
3. Limited to applicants approved by the instructor, department head, etc.
4. Male physicians only.
5. Physicians licensed to practice in the state.
6. Physicians who wish to specialize.
7. Members of the organization.
8. Officers of the United States Army, Navy or Naval Reserve on active duty.
9. Medical Reserve Officers of the United States Army.
10. Fellows and Junior Candidates of the college.
11. A faculty course for staff members of mental institutions.
12. Microscope required.
13. A temporary license to practice medicine in the state is required.
14. A registration fee of $5 covers all courses taken within the year.
15. Plus a laboratory fee.
16. Plus a matriculation fee and/or incidental fee.
17. If two or more students register for the course at the same time, a reduction in the fee will be made.
18. If taken in conjunction with the next course above/below (Gastroscopy/Peritoneoscopy), the fee for the combined course will be $125.
19. Includes a subscription to the organization's publication.
20. No fee for members of the organization.
21. No fee for physicians in military service.
22. Half fee for physicians in the military service.
23. Returned on satisfactory completion of the course.
24. Grants may be made from a scholarship fund.
25. Per diem and/or maintenance provided.
26. A monthly stipend is paid.
27. Assistantships, internships, residencies available.
28. Register two to six weeks in advance.
29. Repeated.
30. Longer courses arranged in units of 12 sessions each.
31. Given at separate hospitals for Negro and white physicians.
32. Applicants must not be over 36 years of age.
33. Plus service in the outpatient department.
34. Part of the course may be taken at a reduced fee.
35. Physicians recommended by directors of state or city health departments.
36. Physicians in the local area.
37. Registration fee of $3 applied on tuition.
38. For M.D.s under 40 years of age.
39. Fifty dollars for M.D.s in armed forces.
40. Continuation of preceding course.
41. Students working for degree given preference.
42. Taken in conjunction with Physiology I at Medical School.
43. Limited to special venereal disease students.
44. Including two meals.
45. Offered in alternate years.
46. Except July and August.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, March 13, page 885.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 15-16. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARIZONA: * Phoenix, April 6-7. Sec., Dr. J. H. Patterson, 826 Security Building, Phoenix.

ARKANSAS: * *Medical.* Little Rock, June 3-4. Sec., Dr. D. L. Owens, Harrison. *Eclectic.* Little Rock, June 3-4. Sec., Dr. C. H. Young, 1415 Main St., Little Rock.

COLORADO: * Denver, April 7-9. *Endorsement.* Denver, April 6. Final date for filing application is March 20. Sec., Dr. J. B. Davis, 831 Republic Building, Denver.

CONNECTICUT: * *Endorsement.* Hartford, March 23. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven.

DELAWARE: Dover, April 13-15. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: * Washington, May 10-11. Sec., Commission on Licensure, Dr. George C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: * Jacksonville, June 21-22. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, March 23-24. Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

HAWAII: Honolulu, June 12-15. Sec., Dr. J. A. Morgan, 55 Young Building, Honolulu.

IDAHO: Boise, July 13. Director, Bureau of Occupational Licenses, Mrs. Lela D. Painter, 355 State Capitol Building, Boise.

ILLINOIS: Chicago, April 6-8. Superintendent of Registration, Department of Registration and Education, Mr. Philip M. Harman, Springfield.

INDIANA: Indianapolis, Sept. 14-16. Sec., Board of Medical Registration & Examination, Dr. W. C. Moore, 301 State House, Indianapolis.

KANSAS: Kansas City, May 19-20. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

LOUISIANA: New Orleans, May 6-8. Sec., Dr. R. B. Harrison, 1507 Hibernia Bank Bldg., New Orleans.

MARYLAND: *Medical.* Baltimore, March 23-26. Sec., Dr. J. T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 15-16. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: * Ann Arbor and Detroit, June 11-13. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 100 W. Allegan St., Lansing.

MINNESOTA: * Minneapolis, March 22-24. Sec., Dr. J. F. DuBois, 230 Lowry Medical Arts Bldg., Minneapolis.

MISSOURI: St. Louis, March 23-25. Sec., State Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City.

MONTANA: Helena, April 6-7. Sec., Dr. Otto G. Klein, First National Bank Bldg., Helena.

NEW JERSEY: Trenton, June 15-16. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * Santa Fe, April 12-13. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NORTH CAROLINA: Raleigh, June 14-18. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, July 6-9. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Endorsement.* Columbus, April 6. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: * Oklahoma City, May 10. Sec., Dr. J. D. Osborn, Jr., Frederick.

RHODE ISLAND: * Providence, April 1-2. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, March 22-24. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: * Pierre, July 20. Dir., Medical Licensure, State Board of Health, Dr. J. F. D. Cook, Pierre.

TENNESSEE: Memphis & Nashville, March 24-27. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.

UTAH: Salt Lake City, June. Dir., Department of Registration, Mr. G. V. Billings, 324 State Capitol Bldg., Salt Lake City.

VERMONT: Burlington, March 25-27. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: Richmond, March 24-27. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WISCONSIN: * Milwaukee, March 30-April 1. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

DISTRICT OF COLUMBIA: Washington, April 19-20. Sec., Commission on Licensure, Dr. George C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: DeLand, June 9. Final date for filing application is May 24. Sec., Dr. J. F. Conn, John B. Stetson University, DeLand.

IOWA: Des Moines, April 13. Dir., Division of Licensure & Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MINNESOTA: Minneapolis, April 6-7. Dr. J. C. McKinley, 126 Millard Hall, Univ. of Minnesota, Minneapolis.

NEBRASKA: Omaha, May 4-5. Dir., Bureau of Examining Boards, Mrs. J. Crawford, 1009 State Capitol Building, Lincoln.

OKLAHOMA: Oklahoma City, April 5. Sec., Dr. J. D. Osborn Jr., Shattuck.

RHODE ISLAND: Providence, May 19. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Building, Providence.

SOUTH DAKOTA: Aberdeen, June 4-5. Sec., Dr. G. M. Evans, Yankton.

WISCONSIN: Madison, April 3. Prof. Robert N. Bauer, 152 W. Wisconsin Ave., Milwaukee.

California June Report

The California State Board of Medical Examiners reports the written examination for medical licensure held at San Francisco, June 30 through July 2, 1942. The examination covered 9 subjects and included 90 questions. An average of 75 per cent was required to pass. Two hundred and thirteen candidates were examined, of whom 211 passed and 2 failed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
College of Medical Evangelists		(1942, 6)	6
Stanford University School of Medicine		(1933), (1941), (1942, 36)	38
University of California Medical School		(1934), (1941), (1942, 79)	81
University of Southern California School of Medicine		(1942, 10)	10
George Washington University School of Medicine		(1942)	1
Georgetown University School of Medicine		(1941)	1
Northwestern University Medical School		(1941), (1942, 4)	5
Rush Medical College		(1936), (1939)	2
University of Chicago, The School of Medicine		(1941, 2), (1942)	3
University of Illinois College of Medicine		(1941)	1
State University of Iowa College of Medicine		(1941)	1
Louisiana State University School of Medicine		(1942, 2)	2
Tulane University of Louisiana School of Medicine		(1941)	1
Johns Hopkins University School of Medicine		(1939, 2)	2
Harvard Medical School		(1938), (1941), (1942)	3
Wayne University College of Medicine		(1942)	1
University of Minnesota Medical School		(1942)	1
St. Louis University College of Medicine		(1941, 3)	3
Washington University School of Medicine		(1938), (1941, 3), (1942, 6)	10
Creighton University School of Medicine		(1941, 4), (1942)	5
Columbia University College of Physicians and Surgeons		(1941)	1
New York Medical College, Flower and Fifth Avenue Hospitals		(1941)	1
University of Cincinnati College of Medicine		(1942)	1
Western Reserve University School of Medicine		(1941)	1
University of Oregon Medical School		(1941, 5), (1942, 2)	7
Temple University School of Medicine		(1941)	1
Woman's Medical College of Pennsylvania		(1941)	1
Medical College of the State of South Carolina		(1941)	1
University of Tennessee College of Medicine		(1941)	1
Medical College of Virginia		(1940)	1
Marquette University School of Medicine		(1942)	1
University of Manitoba Faculty of Medicine		(1935)	1
McGill University Faculty of Medicine		(1940)	1
Karl-Franzens-Universität Medizinische Fakultät, Graz		(1935)	1
Medizinische Fakultät der Universität, Wien		(1924), (1927), (1928), (1933)	4
University of Sofia Faculty of Medicine		(1933)	1
Universita Karlova Fakulta Lékařská, Praha		(1928)	1
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg		(1917)	1
Albertus-Universität Medizinische Fakultät, Königsberg		(1923)	1
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin		(1912), (1924)	2
Ludwig-Maximilians-Universität Medizinische Fakultät, München		(1924)	1
Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau		(1925)	1
Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultasa, Budapest		(1927)	1
Regia Universitá degli Studi di Roma. Facolta di Medicinà e Chirurgia		(1937)	1

School	FAILED	Year Grad.	Number Failed
University of Nebraska College of Medicine		(1942)	1
Universität Bern Medizinische Fakultät		(1939)	1

From June 24 to September 10, 44 physicians were licensed to practice medicine by reciprocity and 16 so licensed by endorsement of credentials. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists		(1939)	Tennessee
Georgetown University School of Medicine		(1933)	Kansas
Rush Medical College		(1932)	Washington, Illinois
The School of Medicine of the Division of the Biological Sciences		(1937)	Minnesota, Illinois
University of Illinois College of Medicine		(1933), (1935), (1939, 2)	Illinois
State University of Iowa College of Homeopathic Medicine		(1906)	Iowa
State University of Iowa College of Medicine		(1928), (1935, 2)	Iowa
University of Kansas School of Medicine		(1937), (1940)	Kansas
University of Louisville School of Medicine		(1936)	Kentucky
Tulane University of Louisiana School of Medicine		(1932)	Louisiana, (1937) Mississippi
Johns Hopkins University School of Medicine		(1933)	Maryland
Harvard Medical School		(1934)	Massachusetts, (1935) Maine
University of Michigan Medical School		(1936, 2)	Michigan
University of Minnesota Medical School		(1940)	Maryland
St. Louis University School of Medicine		(1933)	Missouri
University Medical College of Kansas City		(1897)	Missouri
Washington University School of Medicine		(1936), (1940)	Missouri
Creighton University School of Medicine		(1932)	Kansas, (1937) Nebraska
University of Nebraska College of Medicine		(1938)	Nebraska
Columbia University College of Physicians and Surgeons		(1934)	New York
Long Island College Hospital		(1921)	New York
New York University College of Medicine		(1935), (1936)	New York
University of Rochester School of Medicine and Dentistry		(1938)	Ohio
Ohio State University College of Medicine		(1939)	Ohio
Western Reserve University School of Medicine		(1918), (1932)	Ohio
Meharry Medical College		(1938)	Tennessee
Vanderbilt University School of Medicine		(1940)	Tennessee
University of Wisconsin Medical School		(1935)	Hawaii
Julius-Maximilians-Universität Medizinische Fakultät, Würzburg		(1917)	Illinois

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists		(1939), (1940), (1942)	N. B. M. Ex.
University of Southern California School of Medicine		(1941)	N. B. M. Ex.
University of Colorado School of Medicine		(1925)	U. S. Navy, (1941) N. B. M. Ex.
Yale University School of Medicine		(1940)	N. B. M. Ex.
Northwestern University Medical School		(1927)	N. B. M. Ex.
Harvard Medical School		(1928) U. S. Navy, (1934), (1936)	N. B. M. Ex.
University of Michigan Medical School		(1931)	N. B. M. Ex.
University of Nebraska College of Medicine		(1932)	N. B. M. Ex.
New York University College of Medicine		(1940)	N. B. M. Ex.
University of Pennsylvania Department of Medicine		(1902)	U. S. Army
University of Manitoba Faculty of Medicine		(1933)	N. B. M. Ex.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Dinitrophenol: Blindness Attributed to Use of Drug.—Cecilia Wennerholm and her husband sued the Stanford University School of Medicine, the Stanford University Hospital, the Lane Hospital, the Board of Trustees of Leland Stanford Junior University and several individuals for damages for the loss of the wife's eyesight, purportedly due to the use by the wife of dinitrophenol, manufactured and distributed by one of the defendants, for relief from obesity. The original and first four amended complaints filed by the plaintiffs were framed on a theory of negligence. The defendants, it was charged in those complaints, caused articles to be published in medical journals and elsewhere to the effect that dinitrophenol was harmless. These statements were read and relied on by the plaintiffs and by the physician who attended the wife and prescribed the drug, and the defendants knew or should have known of the dangerous character of the drug but negligently failed to disclose that fact in the articles referred to. The plaintiffs abandoned the theory of negligence and filed a fifth amended complaint predicated on fraud, alleging that (1) the defendants manufactured and distributed to retail outlets dinitrophenol; (2) the defendants falsely stated and represented, in effect, in articles which were caused to be printed in newspapers, pamphlets, circulars and medical journals that dinitrophenol was a harmless drug which could be taken internally by human beings and would reduce excessive weight and alleviate obesity without causing physical harm; (3) as a matter of fact, the defendants well knew that dinitrophenol was poisonous and deleterious to the human body, was inherently dangerous to human life and limb and was liable to cause blindness, and (4) the wife, reading and relying on various statements caused to have been published by the defendants and being ignorant of the falsity of those statements, to reduce obesity purchased and took internally amounts of dinitrophenol daily from March 9 to Dec. 30, 1934 and by reason thereof became blind. The trial court sustained demurrers interposed by the defendants to the complaint, and the plaintiffs appealed to the district court of appeals, first district, division 1, California,

which affirmed the judgment of the trial court. (*Wennerholm v. Stanford University School of Medicine,* 113 P. (2d) 736 (Calif., 1941); J. A. M. A. **119**:903 [July 11] 1942). An appeal was then taken to the Supreme Court of California.

The sole question before the court was whether or not the fifth amended complaint stated a cause of action. If it did, the trial court was in error in sustaining the demurrers. The defendants contended that the complaint did not state a cause of action because it did not specifically allege that the false representations alleged to have been made were made with an intent to deceive the plaintiffs. The court believed, however, that the intent to deceive sufficiently appeared by the facts alleged in the complaint, from which it may be inferred that the alleged false statements were made with the intention of inducing the public to purchase the drug. One who intends to defraud the public, said the court, or a particular class of persons, is deemed to have intended to defraud every individual in the class who is actually misled. The court therefore concluded that, while the complaint was somewhat inartistically framed, it did state a cause of action for fraud.

The defendants next argued that the allegations in the earlier complaints that dinitrophenol had been taken on the prescription of a physician, which allegation was omitted from the amended complaint under consideration, must be read in that complaint and that if such an allegation is read into the last complaint the complaint on its face will conclusively show that the plaintiff did not act in reliance on the representations of the defendants. Even granting, said the court, that the allegation that the plaintiff took the drug on the advice of her physician must be read into the fifth amended complaint, that complaint sufficiently alleges reliance by the plaintiff on the defendants' representations. In actions for fraud it is not required that a defendant's representations be the sole cause of the damage. If they are a substantial factor in inducing the plaintiff to act, even though he also relies in part on the advice of others, reliance is sufficiently shown. In this case there was no allegation in the earlier complaints that the plaintiff relied solely on the advice of her physician; in fact it is alleged in the second amended complaint that "plaintiff and her said physician believed and accepted the recommendations of defendants . . . and relied on the same and the said physician, in reliance thereon, prescribed for plaintiff, and the said plaintiff in reliance thereon and upon the advice of her physician, formed upon such recommendation of the defendants, used said dinitrophenol." In the fifth amended complaint it is alleged that the plaintiff "relying upon . . . the aforesaid representations of said defendants, and not otherwise, purchased and took internally" the said drug. Accepting this statement as qualified by the allegations with respect to the physician in the earlier complaints, it sufficiently alleges that plaintiff relied, at least in substantial part, on the representations of the defendants. The mere fact that a physician prescribed the drug does not establish, as a matter of law, a lack of reliance on the part of the plaintiff which would absolve the defendants from liability. The court did not regard as reasonable the contention advanced by the defendants that in circumstances such as those alleged here a prescribing physician must accept sole responsibility for the treatment which he chooses for his patients. It seems a more reasonable view to us, said the court, that one who manufactures and sells a drug dangerous to life and health, knowing it to be dangerous, should be liable where, as here alleged, both physician and patient rely on the representations made concerning the drug.

The defendants next contended, in support of the trial court's sustaining of the demurrers, that the cause of action is barred by the statute of limitations since the fifth amended complaint, charging fraud while the complaint and the first four amended complaints merely charged negligence, states a new and different cause of action from that alleged in the original complaint. Unless the amended complaint, answered the court, sets forth an entirely different cause of action from the original the amended complaint, for the purposes of the statute of limitations, must be deemed filed as of the date of the original complaint. The modern rule, when an amendment is sought after the statute of limitations has run, is that the amended complaint will be deemed filed as of the date of the original complaint so long as recovery is sought in each complaint on the same general set of facts. A mere change in legal theory will not subject the amended complaint to the bar of the statute of limitations. In the present case the only substantial difference between the factual situations set forth in the original and in the fifth amended complaint is that the former charged that the representations were negligently made while the latter charges that they were made with knowledge of their falsity. Despite the change in legal theory from an action for negligence to one for fraud, it cannot be said that an entirely different cause of action is stated. Therefore the fifth amended complaint, the one under discussion, is not barred by the statute of limitations.

The court accordingly reversed the judgment of the trial court sustaining the demurrers interposed by the defendants.—*Wennerholm v. Stanford University School of Medicine, 128 P. (2d) 522 (Calif., 1942).*

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Birmingham, April 20-22. Dr. Douglas L. Cannon, 519 Dexter Ave., Montgomery, Secretary.

American Association on Mental Deficiency, New York, May 12-15. Dr. Neil A. Dayton, Mansfield Training School, Mansfield Depot, Conn.

American Gastro-Enterological Association, Atlantic City, N. J., May 3-4. Dr. J. Arnold Bargen, 102 Second Ave. S.W., Rochester, Minn., Secretary.

American Neurological Association, New York, May 6-7. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.

American Psychiatric Association, Detroit, May 10-13. Dr. Winfred Overholser, St. Elizabeth's Hospital, Washington, D. C., Secretary.

American Society for Clinical Investigation, Atlantic City, N. J., May 3. Dr. Wesley W. Spink, University Hospital, Minneapolis, Secretary.

American Surgical Association, Cincinnati, May 13-14. Dr. Warfield M. Firor, Johns Hopkins Hospital, Baltimore, Secretary.

Arizona State Medical Association, Tucson, April 30-May 1. Dr. Frank J. Milloy, 112 North Central Avenue, Phoenix, Secretary.

Arkansas Medical Society, Little Rock, April 19-20. Dr. W. R. Brocksher, 602 Garrison Ave., Fort Smith, Secretary.

California Medical Association, Los Angeles, May 2-3. Dr. George H. Kress, 450 Sutter St., San Francisco, Secretary.

Conference of State and Provincial Health Authorities of North America, Washington, D. C., March 22-25. Dr. A. J. Chesley, 469 State Office Bldg., St Paul, Secretary.

Florida Medical Association, Jacksonville, April 15-16. Dr. Shaler Richardson, 111 West Adams St., Jacksonville, Secretary.

Georgia, Medical Association of, Atlanta, May 11-14. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.

Iowa State Medical Society, Des Moines, April 29-30. Dr. Robert L. Parker, 3510 Sixth Avenue, Des Moines, Secretary.

Maryland, Medical and Chirurgical Faculty of, Baltimore, April 27-28. Dr. W. Houston Toulson, 1211 Cathedral St., Baltimore, Secretary.

Mississippi State Medical Association, Jackson, May 11-13. Dr. T. M. Dye, Clarksdale, Secretary.

Missouri State Medical Association, St. Louis, April 18-20. Mr. Raymond McIntyre, 634 North Grand Blvd., St. Louis, Executive Secretary.

National Tuberculosis Association, St. Louis, May 5-6. Dr. Charles J. Hatfield, 7th and Lombard Sts., Philadelphia, Secretary.

New Hampshire Medical Society, Manchester, May 11-12. Dr. Carleton R. Metcalf, 5 South State St., Concord, Secretary.

New York, Medical Society of the State of, Buffalo, May 3-6. Dr. Peter Irving, 292 Madison Ave., New York, Secretary.

North Carolina, Medical Society of the State of, Raleigh, May 10-12. Dr. Roscoe D. McMillan, Red Springs, Secretary.

North Dakota State Medical Association, Bismarck, May 10-11. Dr. L. W. Larson, 221 Fifth Street, Bismarck, Secretary.

Ohio State Medical Association, Columbus, March 30-31. Mr. Charles S. Nelson, 79 East State St., Columbus, Executive Secretary.

Oklahoma State Medical Association, Oklahoma City, May 11-12. Dr. Lewis J. Moorman, 210 Plaza Court Bldg., Oklahoma City, Secretary.

Texas, State Medical Association of, Fort Worth, May 3-6. Dr. Holman Taylor, 1404 West El Paso St., Fort Worth, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

204:781-928 (Dec.) 1942

Nonspecificity of Glomerular Lesions of Kidney. H. A. Christian, Brookline, Mass.—p. 781.
*Nonspecific Effect of Certain Kidney Extracts in Lowering Blood Pressure. O. Schales, E. A. Stead Jr. and J. V. Warren, Boston.—p. 797.
Hormone Effects on Male Gastroduodenal Mucosa. R. H. Abrahamson, R. Church and J. W. Hinton, New York.—p. 809.
Two Dose Glucose Tolerance Test. E. Wayburn and H. Gray, San Francisco.—p. 823.
Pyruvic Acid Metabolism in Diabetes Mellitus. E. Bueding, H. Wortis and H. D. Fein, with technical assistance of Dorothy Esturonne, New York.—p. 838.
Role of Physical Therapy in Rehabilitation of Disabled Soldiers. R. Pemberton, Philadelphia.—p. 846.
*Studies of Biotin Metabolism in Man: Part I. Excretion of Biotin in Human Urine: Part II. Relationship Between Biotin Content of Diet and Its Output in Urine and Feces: III. Excretion of Two Biotin-like Substances in Urine. T. W. Oppel, New York.—p. 856.
Effect of Various Steroids in Intact Male Rats. H. Selye and S. Albert, Montreal, Canada.—p. 876.

Effect of Kidney Extracts on Blood Pressure.—Schales, Stead and Warren injected intramuscularly prepared kidney extracts into the buttocks of 7 patients with arterial hypertension. The patients were hospitalized but were ambulatory throughout their hospitalization. The blood pressure was determined twice a day and the temperature was recorded at least four times a day. The severity of the local reactions was graded from 1 to 4 plus, depending on the amount of induration, erythema and tenderness. Roentgen examination of the heart, electrocardiograms and blood and urine studies were obtained at various times throughout the hospitalization. Four of the 7 patients had malignant hypertension and 3 had a more chronic or benign variety. Of the 2 male patients, both with malignant hypertension, treated for two and three weeks the blood pressure did not show a significant variation nor was there any definite symptomatic change. Only minimal soreness and induration at the site of injection occurred. In the remaining 5 female patients the daily intramuscular injection of kidney extract produced a significant decline in arterial pressure. The initial injections were followed by slight tenderness and pain at the site of injection, but after two to ten days a more severe type of reaction occurred. Several hours after injection the site was surrounded by an area of pronounced induration, which usually involved the entire buttock and frequently spread over the sacral and lumbar regions. The skin was red and hot, and often an erythematous confluent macular eruption occurred, which involved not only the skin of the injected buttock but also the skin of the sacrum and the lateral and anterior aspects of the thigh parallel to and just below the inguinal ligament. Associated with this severe local reaction there were various constitutional symptoms of fever, chills, sweating, anorexia and lethargy. A significant lowering of the arterial pressure appeared to be related to the fever, sweating, weakness, anorexia and severe local reactions. Injection of extracts poor in hypertensinase produced a fall in arterial pressure similar to that produced by the unmodified extract. The conclusion is that the decrease in arterial pressure was produced by a nonspecific effect of the renal extracts on the body rather than by specific interference with a renin-hypertensin system.

Biotin Metabolism in Man.—In his study of the excretion of biotin in the urine of man, Oppel found that normal subjects on unrestricted diets excreted from 7 to 89 micrograms of biotin (as measured by yeast growth stimulation) per liter of urine. With ordinary diets the biotin elimination varied daily and throughout the day. There was a striking increase immediately after a large dose of crude biotin was ingested. The biotin excreted in the urine of those who ate well was greater than of those whose intake of food was poor. It was relatively constant for those who ate the same food every day. The biotin excretion of patients with various diseases showed the values to be within the normal range, and even during periods of starvation the excretion was not abnormally low. A study of a small group of hospital patients on diets of known biotin content revealed that if the daily biotin intake was constant the biotin excretion also was constant for each subject. When diets containing 35 and 65 micrograms of biotin were taken on alternate days, the urine showed corresponding daily fluctuations. The average daily biotin content of the feces appreciably exceeded the biotin content of the diet. The total biotin output in the urine and the feces was three to six times as much as the dietary intake. The material in the urine which gives the biotin test by the yeast growth assay can be separated into an avidin combining and a non-avidin combining fraction; both fractions have been found in the urines of the human being, dog, rabbit and rat. The avidin combining fraction is probably biotin. Its excretion in the urine varies with the amount of biotin in the diet. Small amounts of it were excreted by patients taking diets containing large amounts of egg white and none in the urines of 2 biotin deficient rats. The non-avidin combining fraction has been found in all urine tested and its quantity was not changed by the biotin content of the food or by oral doses of biotin. Only minute amounts of the non-avidin combining fraction were found in diets and feces.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

48:715-868 (Dec.) 1942

Vertebral Vein System as Mechanism for Spread of Metastasis. O. V. Batson, Philadelphia.—p. 715.
Tuberculosis of Greater Trochanter and Its Bursa. M. S. Donovan and M. C. Sosman, Boston.—p. 719.
Renal Osteitis. M. L. Sussman and M. H. Poppel, New York.—p. 726.
Hurler-Pfaundler Syndrome (Gargoylism): Review of Literature with Report of Additional Case. R. M. Harvey, Philadelphia.—p. 732.
*Survey of Deaths and Unfavorable Sequelae Following Administration of Contrast Mediums. E. P. Pendergrass, G. W. Chamberlin, E. W. Godfrey and E. D. Burdick, Philadelphia.—p. 741.
*Ocular Test for Sensitivity to Diodrast Prior to Intravenous Urography. V. W. Archer and I. D. Harris, University, Va.—p. 763.
Hypersensitivity to Diodrast as Determined by Skin Tests. S. A. Robins, Boston.—p. 766.
Value of Excretory Urography in Interpretation of Renal Function. K. Kornblum and T. R. Fetter, Philadelphia.—p. 770.
Cystic Disease of Upper Urinary Tract: Pyelitis Cystica and Ureteritis Cystica. A. E. Bothe; and D. S. Cristol, Rochester, Minn.—p. 787.
Multiple Saccular Aneurysms of Aorta: Report of Three Cases. M. Wilburne and H. K. Taylor, New York.—p. 797.
Roentgen Diagnosis of Appendical Fecaliths. J. Jackman, Cleveland.—p. 803.
Roentgen Ray Dosage During Routine Diagnostic Studies. M. I. Smedal, Boston.—p. 807.
Roentgen Therapy of Primary Cancer of Nasopharynx. M. Lenz, New York.—p. 816.

Unfavorable Sequelae After Injection of Contrast Mediums.—The death of a patient following the intravenous administration of 3,5-diiodo-4-pyridone-N-acetic acid and diethanolamine (diodrast) for a urographic study prompted Pendergrass and his associates to send questionnaires to radiologists and urologists. The latter returned information on 220,000 urograms and the former on 441,800. An analysis of the data showed that there were 26 deaths in addition to the 11 already reported in the literature. Ten deaths were immediate, the result of hypersensitivity or idiosyncrasy to the drug injected or to colloidal shock, and 16 deaths were delayed, presumably because of preexisting major renal damage. All immediate deaths were of patients who had received diodrast and were preceded by symptoms of anaphylactic shock, although they may not have been due to an "anaphylactoid reaction." Overdosage may have been the cause. The contrast medium in the delayed deaths had not been proved to be an etiologic factor. Toxic reactions may occur, especially in patients with previous renal damage and urea reduction. No immediate deaths have been reported following retrograde pyelography with contrast mediums. Instances of nonfatal hypersensitivity, simulating anaphylactic shock, have occurred following the intravenous use of contrast mediums. Contrast mediums are contraindi-

cated in patients with severe hepatic disorders, nephritis, exudative diathesis (in children), allergy and severe uremia. They should be used with caution in pulmonary tuberculosis, hyperthyroidism, in patients in whom a reduction of blood pressure would be dangerous and in patients who have had repeated injections of contrast mediums. To prevent anaphylactic reactions the oral, intravenous, intradermal and conjunctival tests are helpful. However, their use will not warn adequately against the toxic reaction. Therefore, with the increased use of contrast mediums, radiologists and physicians should be on the alert so that its use, which has permitted such great advances in diagnosis, and its users will not fall into disrepute.

Test for Contrast Medium Sensitivity.—Archer and Harris outline an ocular test for discovering a patient's sensitivity to diodrast. The test is accurate, quick and simple and has been used in more than 600 cases, sometimes even in the face of historical contraindications such as allergy, hypertension, previously administered sulfonamides and iodides. The eyes are examined for comparison and a drop of the dye is placed directly on the conjunctiva of one eye. The patient closes his eyes as in sleep for one and a half minutes, after which the eyes are examined (daylight is preferable) and then again two minutes later. The reacting eye is compared with the control. The injection of the vessels of the sclera and conjunctiva is the criterion of the test. The reactions are divided into minimal, moderate and decided types. In a minimal reaction the dye may have no effect, or the patient states that he has a hot flash and some nausea. Patients with moderate injection react to intravenous injection with nausea, vomiting, vasomotor dilatation and occasionally generalized pruritus, urticaria and some slight swelling of the membranes of the upper part of the respiratory tract. The reactions are temporary with no sequelae. In decided injection the vessels are engorged from the iris to the periphery. This absolutely contraindicates the intravenous use of the dye. These dangerous reactions have included vasomotor and respiratory collapse, laryngeal edema, severe asthma, generalized urticaria, pruritus and even (delayed) dermatitis. As some patients complain of temporary burning in the tested eye they should be forewarned so that they will not rub the eye, thus produring a false positive reaction. The reaction in the muddy scleras of Negroes is harder to read, but a unilateral difference is readily discernible. There should be no alcohol on or in the needle of the syringe, as with the dye it causes a decided reaction.

Annals of Otol., Rhin. and Laryngology, St. Louis

51:891-1184 (Dec.) 1942. **Partial Index**

Developmental Anatomy of Human Stapes. B. J. Anson and E. W. Cauldwell, Chicago.—p. 891.
Functional Aphonia. L. H. Clerf, Philadelphia, and F. J. Braceland, Chicago.—p. 905.
Impaired Hearing in Children and Size of Adenoids in Relation to Some Anthropometric Data and to Condition of Teeth. Ella Langer, Baltimore.—p. 931.
*Local Use of Sulfonamides, Gramicidin (Tyrothricin) and Penicillin in Otolaryngology. J. E. Bordley, S. J. Crowe, D. A. Dolowitz and K. L. Pickrell, Baltimore.—p. 936.
The Sulfonamide Drugs in Treatment of Acute Otitis Media. H. G. Tobey, Boston.—p. 945.
*Effect of Androgen Therapy on Voice and Vocal Cords of Adult Women. J. L. Goldman and U. J. Salmon, New York.—p. 961.
Effect of Experimentally Altered Air Pressure in Middle Ear on Hearing Acuity in Man. W. E. Loch, Baltimore.—p. 995.
Earache: Common Causes and Probable Nerve Pathways. G. E. Tremble, Montreal, Canada.—p. 1017.

Bacteriostatic Compounds in Otolaryngology.—The experience that Bordley and his colleagues have had with bacteriostatic agents indicates that many of the complications of secondary infections of the sinuses, ears and lymphoid tissue and much of the discomfort of acute coryza or nasopharyngitis may be prevented by spraying the nasal passages and pharynx with a 2.5 per cent sulfadiazine triethanolamine solution at least eight times a day during the first two days and five or six times a day for the next two or three days. The results of a rigidly controlled experiment in 30 student nurses who reported for treatment in an average of twenty-four hours after onset of acute coryza or nasopharyngitis show the spray to be most efficacious. Without their knowledge the nose, nasopharynx and pharynx of alternate patients were sprayed with the solvent (triethanolamine) and of the others with the solvent plus 2.5 per cent sulfadiazine. Two of the 16 treated patients had slight clouding of one antrum on transillumination, which cleared without local treatment, while in the control group 7 of 14 patients had complicating infection of accessory nasal sinuses. One patient had had acute sinusitis with each cold during the past four years, and six such attacks during the previous winter required irrigation of an antrum. During the past winter the absence of sinus infection was attributed to the use of the sulfadiazine spray. Gramicidin was most valuable when used to supplement surgical operation. Postoperative fever, swelling, pain and irrigation or frequent dressings may all be prevented by painting the entire operative area with gramicidin and packing the wound with gauze saturated with gramicidin. This result is obtained only when the infecting organisms are sensitive: aerobic or anaerobic streptococci or some type of pneumococci. The strength of the gramicidin suspension must not exceed 1 mg. per cubic centimeter. Sterile penicillin (the filtrate) is suitable for local application in infected wounds and for irrigation of the middle ear or accessory nasal sinuses. Penicillin is superior to gramicidin in that it is soluble in water, penetrates tissues and is neither toxic nor irritating to mucous membranes. It is especially effective for staphylococci and bactericidal for aerobic and anaerobic streptococci and pneumococci. As with gramicidin, certain strains of these organisms may be resistant. Therefore their intelligent use necessitates careful bacteriologic study of each patient.

Effect of Androgen Therapy on the Voice of Women.—According to Goldman and Salmon, in 23 of more than 400 patients receiving androgen therapy for various endocrinopathic gynecologic disorders, symptoms of hoarseness, huskiness and masculine pitch associated with structural alterations of the vocal cords were observed. The vocal cords, on indirect mirror laryngoscopy, showed a characteristic picture of generalized suffused swelling with injected blood vessels. A pale off-white color with caudal extension of the swelling, making the subglottic surfaces of the cords visible, was a consistent laryngeal feature. The vocal disturbance and physical alterations persisted for varying periods, up to two and a half years after androgen therapy was withdrawn in 11 cases. The study suggests that there is a striking similarity between the vocal and laryngeal changes in women who receive androgen therapy and the physiologic development of the voice and larynx in boys at puberty. To avoid the changes in women receiving androgen therapy the dose must be kept below the threshold for these phenomena. For the average woman this threshold is approximately 500 mg. of testosterone propionate per month. As an additional safeguard against androgen overdosage is the taking of weekly vaginal smears and the discontinuance of therapy if the effects of androgen appear in the smear.

Archives of Surgery, Chicago

46:1-166 (Jan.) 1943

*Treatment of Burns with Chemotherapeutic Membranes. W. D. Andrus, W. F. Nickel, New York, and F. C. Schmelkes, Belleville, N. J.—p. 1.
Gallstone Ileus. P. R. Hinchey, Salem, Mass.—p. 9.
*Pulmonary Embolism: Clinical and Experimental Study. W. J. Potts, Oak Park, Ill., and S. Smith, Orlando, Fla.—p. 27.
Wound Healing: Effect of Sterile Abscess on Fibroplasia in Wound Healing. G. B. Sanders; and W. S. Garrison, Philadelphia.—p. 40.
Fate of Procaine in Human Body After Subarachnoid Injection. A. Goldberg, H. Koster and Rose Warshaw, Brooklyn.—p. 49.
Thoracoabdominal Gunshot Wounds: Review of Eighty-Four Cases. H. G. Hardt Jr. and L. Seed.—p. 59.
Progress in Orthopedic Surgery for 1941: Review Prepared by an Editorial Board of American Academy of Orthopedic Surgeons.—p. 74.
Review of Urologic Surgery (concluded). A. J. Scholl, Los Angeles; F. Hinman, San Francisco; A. von Lichtenberg, Mexico, D. F., Mexico; A. B. Hepler, Seattle; R. Gutierrez, New York; G. J. Thompson, J. T. Priestley, Rochester, Minn.; E. Wildbolz, Berne, Switzerland, and V. J. O'Conor, Chicago.—p. 138.

Treatment of Burns with Chemotherapeutic Membranes.—Andrus and his associates used preformed hydrated chemotherapeutic membranes (eschars) in the treatment of second degree burns of 10 patients. The membranes contained 10 per cent sulfanilamide and buffer, with and without azochloramid. If after their application excessive oozing threatens to disintegrate the film a second or third layer can be applied over the first. Also by mounting these films on gauze they can be made into sheets large enough to encircle the torso of an adult. The longest elapsed time required for complete healing

(return to work) was twenty-one days; this was in a case in which extensive burn about the head involved all the hair and eyebrows. The following technic was used: The burn was first debrided and thoroughly cleansed with saline, boric acid or azochloramid solution. All dead skin was removed and the preformed membrane was applied directly to the raw oozing surface. A dry sterile dressing was placed over the membrane and held by a plain gauze bandage. Given a large number of burns (on board ship for instance) the membrane can be applied quickly and easily by any one trained in first aid and can be held in position by the dry dressing. If its removal is necessary it is moistened with sterile water or saline solution. Since submitting their paper the authors have treated 10 additional patients who had severe second degree burns; their average healing time was nine days. The burn of 1 patient involved 55 and of 1 patient 35 per cent of the surface of the body. Healing in both was complete in twelve days.

Pulmonary Embolism.—Potts and Smith studied the value of exercise in lessening the incidence of pulmonary thrombosis. Their material consists of 837 private patients who have carried out the exercises the evening of the operation and each morning and evening thereafter and a control group of 124 patients with fractures which required immobilization and 150 surgical patients who did not carry out the postoperative exercises. The exercises consisted of fifteen deep breaths and active flexing of the legs with each breath. There has been no phlebothrombosis or pulmonary embolism among the 837 private patients. In the first control group there were 5 instances of phlebothrombosis, 4 were followed by pulmonary infarction, and pulmonary embolism was found in 1 at postmortem examination. The origin of the emboli could not be found. Among the surgical control group 4 patients had phlebothrombosis; in 2 the thrombosis followed drainage of an appendical abscess, in 1 the release of a mechanical intestinal obstruction and in 1 the abdominoperineal resection of the rectum. Experimentally the authors have produced thrombosis in the femoral vein of a dog after double partial ligation.

Bulletin New York Academy of Medicine, New York

19:1-74 (Jan.) 1943

Principles of Treatment of Closed Head Injury. D. Denny-Brown, Boston.—p. 3.
Use of Vitamins in Clinical Neurology. C. D. Aring, Cincinnati.—p. 17.
Speech Disorders and Their Treatment. S. Cobb, Boston.—p. 34.
Prevention and Treatment of Convulsive Disorders. W. G. Lennox, Boston.—p. 47.
Some Medical Problems of Vesicant Chemical Warfare Agents as Affecting Civilian Populations. L. Goldman, Cincinnati.—p. 57.

Journal of Pharmacology & Exper. Therap., Baltimore

76:295-400 (Dec.) 1942. **Partial Index**

Local Anesthetic Properties of Cinnamylephedrine. F. H. Schultz Jr. and P. H. Barbour Jr., New Haven, Conn.—p. 295.
Some New Aspects of Morphine Action: Effect on Stomach. D. Slaughter, A. B. Goddard and W. M. Henderson, Dallas, Texas.—p. 301.
Pyretic Action on Rats of Small Doses of Morphine. J. B. Herrmann, New Haven, Conn.—p. 309.
*In Vitro and In Vivo Studies of Gramicidin, Tyrothricin and Tyrocidine. H. J. Robinson and O. E. Graessle, Rahway, N. J.—p. 316.
Study of Similarities of Several Representative Types of Bismuth Preparations Used in Therapy of Experimental Syphilis. N. M. Clausen, B. J. Longley, R. E. Green and A. L. Tatum, Madison, Wis.—p. 338.
*Metabolism, Toxicity and Manner of Action of Gold Compounds Used in Treatment of Arthritis: IV. Studies of Absorption, Distribution and Excretion of Gold Following Intramuscular Injection of Gold Thioglucose and Gold Calcium Thiomalate. W. D. Block, O. H. Buchanan and R. H. Freyberg, Ann Arbor, Mich.—p. 355.
Trypanocidal Action of 3-Amino-4-Hydroxyphenyl Arsenious Oxide ("Mapharsen") Administered Orally with Glutathione. S. M. Rosenthal, Bethesda, Md.—p. 358.
Nature of Emetic Action of Digitalis Bodies and Related Compounds. H. F. Haney and A. J. Lindgren, Portland, Ore.—p. 363.

Studies of Gramicidin, Tyrothricin and Tyrocidine.—In their in vitro and in vivo studies of the bactericidal activity of gramicidin, tyrothricin and tyrocidine Robinson and Graessle found that the last two appear to exert a decided bactericidal action on aerobic and anaerobic gram positive bacteria in the absence of blood or serum; under similar conditions gramicidin appears to be primarily bacteriostatic. When blood or serum is present tyrocidine and tyrothricin lose their bactericidal properties, whereas gramicidin retains its bacteriostatic properties; under these conditions tyrothricin becomes primarily bacteriostatic. In vivo results indicate that gramicidin and tyrothricin intraperitoneally in infected mice are active whereas tyrocidine is not. Gramicidin or tyrothricin are effective only when given in direct contact with the infecting bacteria. Oral, subcutaneous or intravenous treatment did not protect mice infected peritoneally. Likewise, mice infected by vein were not protected by intraperitoneal treatment.

Distribution and Excretion of Gold in Arthritis.—Following the intramuscular injection into the white rat of oily suspensions of gold calcium thiomalate and gold thioglucose, Block and his associates found the rate of absorption of the gold to be somewhat faster in the case of the latter compound. Larger amounts of gold were present in the kidneys and liver than in other tissue studied. Excretion occurred through the kidneys and the gastrointestinal tract. The chief route of excretion of the soluble gold thioglucose was the kidneys, while gold was excreted primarily in the feces following the administration of the insoluble gold calcium thiomalate.

Journal of Urology, Baltimore

48:563-800 (Dec.) 1942. **Partial Index**

Papillary Carcinoma of Right Kidney: Report of Case with Atypical History and Findings. H. A. Fowler, Washington, D. C.—p. 563.
Certain Capsular and Subcapsular Mixed Tumors of Kidney Herein Called "Capsuloma." S. H. Colvin Jr., Rochester, Minn.—p. 585.
Carcinoma of Kidney and Pregnancy. A. E. Vitt and W. F. Melick, St Louis.—p. 601.
Intravenous Urography During Renal Pain from Ureteral Stricture. J. F. McCahey and J. S. Fetter, Philadelphia.—p. 622.
Osteitis Pubis: Report of Case in a Woman. S. Kleinberg, New York.—p. 635.
Analysis of Urinary Calculi Through Use of Polarizing Microscope. A. Randall 4th, Boston.—p. 642.
Pancreatic Lesions Confusing Urologic Diagnosis: Report of Three Cases. J. K. Ormond, G. H. Wadsworth and H. V. Morley, Detroit.—p. 650.
Intersexuality: Operation and End Results: Case. F. L. Senger and E. K. Morgan, Brooklyn.—p. 658.
Studies in Malignant Testis Tumors: VIII. Tumors in Pseudohermaphrodites: Review of Sixty Cases and Case Report. J. B. Gilbert, Schenectady, N. Y.—p. 665.
*Castration for Carcinoma of Prostate: Report of Immediate Results. E. P. Alyea and A. F. Henderson, Durham, N. C.—p. 673.
*Experiences in Treatment of Carcinoma of Prostate with Stilbestrol and with Castration by Technic of Intracapsular Orchiectomy. R. Chute, A. T. Willetts and J. P. Gens, Boston.—p. 682.
Technic for Castration in Carcinoma of Prostate. E. Hess, Erie, Pa.—p. 703.
*Eight Year Results of Castration for Cancer of Prostate. A. Randall, Philadelphia.—p. 706.
Introduction of Solution into Tubuloalveolar System of Prostate Gland: New Method Useful in Diagnosis and Therapy. H. R. Trattner, Cleveland.—p. 710.
Diagnosis and Prognosis of Male Infertility: Study of Forty-Four Cases, with Special Reference to Sperm Morphology. L. Portnoy, New York.—p. 735.
Excretion of Halogenized Phenols and Their Use in Treatment of Urogenital Infections: Percutaneous Chemotherapy. B. Zondek, Jerusalem, Palestine.—p. 747.
Action of Testosterone Propionate on Kidneys of Rats, Dogs and Men. J. K. Lattimer, New York.—p. 778.

Castration for Carcinoma of Prostate.—Alyea and Henderson discuss the immediate response to castration of 40 patients with carcinoma of the prostate. The procedure was carried out on all during the past year. Contact was made with all but 1 for this first follow-up, 4 died (1 one day postoperatively from shock, 1 one month postoperatively from heart disease, 1 four months postoperatively from cerebral hemorrhage and 1, the 1 unsatisfactory case, recently from carcinomatosis), 30 returned to the clinic for reexamination and 5 answered the authors' questionnaire by mail. The early results show that their general improvement was astounding. All claimed to feel better than they had in years, with decided improvement in appetite, energy and well being. The only adverse results have been the loss of libido and potentia in all but 1 and hot flashes in 3. The hot flashes have been controlled by small doses of diethylstilbestrol for three to five days at a time. The relief of pain from metastasis was most remarkable. In 1, such pain with extension of the disease returned after eight months of comfort. Changes in the primary growth following castration were evident clinically and at necropsy. Roentgenograms show the healing of bone in metastatic areas after castration and in 4 in disappearance of a metastatic tumor in the lungs after castration.

Treatment of Carcinoma of Prostate.—In treating their last 27 cases of inoperable carcinoma of the prostate Chute, Willetts and Gens employed castration, estrogen or a combination of the two in 21. Clinically only 1 patient was not decidedly benefited by the treatment. In a few cases the improvement almost suggested cure. The most immediate and striking effect was rapid relief from severe pain due to metastasis, if present, and then great improvement in appetite and general health with gain in weight and a reduction in the size and induration of the prostate with an improvement in the ability to urinate. The quickest and most satisfactory results were obtained by castration followed by the injection of 10 mg. of diethylstilbestrol a day for five to ten days. After castration, libido and the power of erection usually disappeared; there were no other harmful effects. No beneficial effect was observed on bony metastasis. Roentgenograms taken over a period of more than six months showed apparent progress as usual.

Castration for Cancer of Prostate.—Randall presents the histories of 5 patients with carcinoma of the prostate who were castrated seven, eight and nine years ago in the hope of influencing their inoperable carcinoma. Of these patients none were cured of the malignant process. Urinary obstruction, in addition to the malignant process, was present in all. The microscopic sections in the 4 patients who have since died have been reviewed and the diagnosis has been reaffirmed. It has been especially difficult to trace any record of clinical benefit. They lived respectively for seventeen months, three and a half years, forty-three days and eight months. In 2 at least there was definite clinical improvement, but this the author believed was due probably as much to the prostatic resection as to the castration. The one living patient is now 70 and was castrated six and a half years ago. Now his referring physician writes that the patient was in good health, free from pain or urinary difficulty until April 1941, when he complained of pain in the lower part of his back and of pain of the right hip and the inability to move his right leg. Roentgen examination revealed massive metastasis of the dorsolumbar spine. Three courses of epidural and subdural procaine injections relieved all pain, with eventual recovery of the function of the right leg. After the use of diethylstilbestrol and several courses of roentgen therapy to the prostate the patient is now free from all pain and voids well enough to dispense with a catheter. The prostate is hard and of relatively normal size. His appetite is good, his weight is constant and his general condition is good. The author points out that he does not present these cases as an argument against the trend of present day therapy but only as an experience of several years' standing that stands as a fact and should be recorded before a wave of enthusiasm (and of castration) passes over this country.

Public Health Reports, Washington, D. C.

57:1963-2002 (Dec. 25) 1942

Ornithodoros Ticks as Medium for Transportation of Disease Agents. R. R. Parker.—p. 1963.
Variations in Rat Infestation on Vessels. R. Olesen and G. C. Sherrard.—p. 1966.
Incidence of Cancer in Denver, Colo., 1939. H. J. Sommers.—p. 1971.

58:1-32 (Jan. 1) 1943

Coccidioidomycosis in Wild Rodents: Method of Determining Extent of Endemic Areas. C. W. Emmons.—p. 1.
Bacteriostatic Action of Sulfonamide Compounds on Clostridia. S. M. Rosenthal.—p. 5.
*Treatment of Young White Mice Infected with Leptospira Icterohemorrhagiae with Immune Serum. C. L. Larson.—p. 10.
*Herpes Simplex Virus Recovered from Spinal Fluid of a Suspected Case of Lymphocytic Choriomeningitis. C. Armstrong.—p. 16.

Immune Serum for Leptospira Icterohemorrhagiae in Mice.—Larson tested the value of specific immune leptospirosis serum and the concentrated fraction of this serum in the treatment of groups of 24 mice infected with Weil's disease. The materials were given one, three, five and six days after infection. Both materials were effective when administered on the third day of infection, only about 50 per cent of the animals survived when treatment was instituted on the fifth day and none survived if serum was withheld until the sixth day. As a control, 0.3 cc. of normal rabbit serum was administered intraperitoneally to 24 infected mice twenty-four hours after infection had been induced. All but 1 of the animals died and presented typical signs and symptoms of leptospirosis. The method of determining the efficacy of the material included titration of the infective agent, titration of the specific protective antibodies in the specimen of serum or plasma tested and their inoculation into infected mice.

Herpes Simplex Virus in Spinal Fluid in Lymphocytic Choriomeningitis.—Armstrong reports the isolation of a strain of herpes simplex virus from the spinal fluid of a Negro of 15 suspected of having lymphocytic choriomeningitis. Blood drawn during the attack did not protect mice against herpes infection, while a sample drawn after recovery had protective properties. Demonstrable antibodies against choriomeningitis were absent from all samples tested. The evidence suggests that herpes simplex virus may in rare instances be the causative agent of some aseptic or lymphocytic meningitis for which the cause is otherwise undeterminable.

Quarterly J. Studies on Alcohol, New Haven, Conn.

3:347-530 (Dec.) 1942

Acetoin Not a Product of Metabolism of Alcohol. L. A. Greenberg, New Haven, Conn.—p. 347.
Some Factors Influencing Intoxicating Effect of Alcoholic Beverages. H. W. Newman and M. Abramson, San Francisco.—p. 351.
Influence of Intravenously Administered Alcohol on Emptying Time of Stomach. L. A. Greenberg, G. Lolli and Miriam Rubin, New Haven, Conn.—p. 371.
Alcohol and Public Opinion. D. Anderson, New York.—p. 376.
Religion and Church in Relation to Alcohol Addiction: I. Religious Resources in Treatment of Alcohol Addiction. O. R. Rice, New York.—p. 393.
Id.: II. Aspects Other Than Therapeutic. S. Hiltner.—p. 400.
Study of Personalities of 289 Abnormal Drinkers. W. Fleeson, Minneapolis, and E. F. Gildea, St. Louis.—p. 409.
Legal Regulation of Alcohol Education. Anne Roe, New Haven, Conn.—p. 433.
"Death from Alcoholism" in the United States in 1940: Statistical Analysis. E. M. Jellinek, New Haven, Conn.—p. 465.

Yale Journal of Biology and Medicine, New Haven

15:139-294 (Dec.) 1942

*Feline Virus Pneumonia and Its Possible Relation to Some Cases of Primary Atypical Pneumonia in Man. F. G. Blake, M. E. Howard and H. Tatlock, New Haven, Conn.—p. 139.
Toxicity and Potential Dangers of Aliphatic and Aromatic Hydrocarbons. W. F. von Oettingen, Bethesda, Md.—p. 167.
Cerebral Hemorrhage in Hemophilia: Case Report with Necropsy Findings. P. F. Mark, New Haven, Conn.—p. 185.
Effect of Cholinergic Drugs on Recovery of Function Following Lesions of Central Nervous System in Monkeys. A. A. Ward Jr. and Margaret A. Kennard, New Haven, Conn.—p. 189.
Salmonella Javiana Food Infection. R. D. Alley and M. Pijoan, Albuquerque, N. M.—p. 229.
Study of p_H Stability of Vaccinia Virus. J. M. Hale, New Haven, Conn.—p. 241.
Patent Ductus Arteriosus Complicated by Subacute Bacterial Endarteritis: Report of Case Successfully Treated by Chemotherapy and Surgery. A. B. Dayton and G. E. Lindskog, New Haven, Conn.—p. 259.
Effect of Exercise on Production of Typhoid Agglutinins. S. E. Wedberg, New Haven, Conn.—p. 263.
The Early New England Doctor: Adaptation to Provincial Environment. M. S. Beinfield, Brooklyn.—p. 271.

Feline Virus and Atypical Human Pneumonia.—Blake and his collaborators record the occurrence of an illness on Nov. 7, 1941 in a young farmer which resembled primary atypical pneumonia of the type which has been increasingly prevalent since 1934. The history revealed not only that 2 other members of the household had recently had a similar illness and that 1 was sick at present but also that 8 of 12 cats on the farm had died of a respiratory disease during October and that 2 of the remaining 4 cats were sick with the same illness. The possibility that the afflicted members of the family and the cats were infected with the same agent suggested itself and an attempt to isolate an etiologic agent by transmission experiments in cats and mice was carried out. A virus capable of producing a similar pneumonia in cats was recovered from the lungs of 1 of the cats. Kittens appeared to be more susceptible to the virus than were full grown cats. The virus failed to infect mice and therefore appears to differ from most viruses causing infections of the respiratory tract. The evidence so far obtained suggests, but does not establish, the fact that the respiratory infection in the patients may have been caused by the virus causing the illness in the cats.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

65:233-342 (Sept.) 1942

Effect of Prolonged Increased Cerebrospinal Fluid Pressure on Venous Pressure in Superior Longitudinal Sinus of Dog. T. H. B. Bedford. —p. 233.

Effects of Striatal Injury. F. A. Mettler and Cecilia C. Mettler.—p. 242.

*Electroencephalographic Studies in Epilepsy: Critical Analysis. K. H. Finley and J. B. Dynes.—p. 256.

Intracranial Conditions After Closed Head Injuries. A. A. McConnell. —p. 266.

Repair of Large Gaps in Peripheral Nerves. F. K. Sanders.—p. 281.

Electroencephalographic Studies in Epilepsy.—In the course of obtaining 4,500 electroencephalographic tracings of patients with a wide variety of neuropsychiatric disorders, Finley and Dynes were impressed by the variation of abnormal patterns within any given clinical group and by the similarity of many patterns in many diverse clinical disorders. An analysis of the electroencephalograms of 626 unselected epileptic patients shows that 86 per cent of the tracings were borderline or abnormal and 14 per cent were normal. Many of the patterns obtained from these patients were also found in other neuropsychiatric conditions. The spike and wave patterns usually furnished by epileptic patients occurred in less than 10 per cent. Less than half of these spike and wave patterns were from patients with petit mal epilepsy. Because of the foregoing, the use of clinical terminology in describing the brain wave patterns of epileptic patients is misleading. The electroencephalogram can continue to be of practical value to the neuropsychiatrist in the diagnosis of epilepsy if used as an adjunct to other laboratory data, the history and the clinical signs and changes.

British Journal of Ophthalmology, London

27:1-48 (Jan.) 1943

Possible Fallacy in Use of Cross Cylinder. F. A. Williamson-Noble. —p. 1.

Deficiency of Malar Bones with Defect of Lower Lids. Ida Mann and T. P. Kilner.—p. 13.

Id.: Case. I. L. Johnstone.—p. 21.

Unilateral Involvement of Optic Nerve in Head Injuries. F. C. Rodger. —p. 23.

Voluntary Convergence. W. R. Mathewson.—p. 34.

"Hole" at Macula Due to Looking at the Sun: Case. C. A. Pittar.—p. 36.

British Journal of Surgery, Bristol

30:89-188 (Oct.) 1942

*Abdominal Surgery of "Total War." G. Gordon-Taylor.—p. 89.

*Nonpenetrating Injuries of Abdomen: Reports on Two Cases. D. O'Callaghan.—p. 107.

*Further Contributions to Causation and Treatment of Duodenal Ulcer and Its Complications. T. H. Somervell.—p. 113.

Pelvic Dislocations. R. G. Taylor.—p. 126.

Report of Four Cases of Esophageal Carcinoma Treated by Excision. P. R. Allison.—p. 132.

Successful Removal of Thoracic Esophagus for Carcinoma: Two Cases. R. H. Franklin.—p. 141.

Cardioesophageal Resection for Tumor of Cardia: Report of Successful Case. R. C. Brock.—p. 146.

Aneurysm of Splenic Artery: Account of Example Complicating Gaucher's Disease. Sheila P. V. Sherlock and J. R. Learmonth.—p. 151.

Lingual Thyroid: Report of Case with Unusual Histology. H. Wapshaw.—p. 160.

Abdominal Surgery of "Total War."—Gordon-Taylor reviews the six hundred operations on the abdomen for injuries that he has encountered after more than two and a half years of conflict. The series includes abdominal injuries received in naval warfare, civilians damaged by air bombardment and certain army casualties from the flotsam and jetsam of the "Dunkirk miracle" and the evacuation of northern France, and others from the Royal Air Force who were brought down during the epochal "Battle of Britain." These cases, representing various types of injury from numerous missiles, have been collected haphazardly and afford no criterion for estimating the percentage of the total abdominal casualties for which surgery can be profitably employed. Despite the gravity of the wounds and the frequent association of multiple injuries, approximately 50 per cent of the patients with abdominal injury for whom operation was possible survived. The present military situation permits of no information as to the percentage of these casualties for which operation has been possible. The percentage of recoveries for injuries to the stomach, the small intestine, the rectum and the spleen is higher than in 1914-1918; the recovery rate for injuries to the large intestine is the same. Few patients with extensive intestinal resections have survived; the successful cases have been mainly dealt with by suture. Exteriorization resections of the large intestine have not figured prominently among successful resections of the colon. The employment of the sulfonamides, locally and orally, has proved of inestimable value. The liberal transfusion of blood or blood derivatives has permitted operation on a host of patients who would otherwise have died. The abdominal surgery of "total war" is really successful.

Nonpenetrating Injuries of Abdomen.—O'Callaghan reports 2 instances of nonpenetrating injuries of the abdomen with visceral damage that occurred in civil life but that are not unlike those that can and do occur under wartime conditions. The injury in 1 was retroperitoneal rupture of the duodenum associated with laceration of the liver. The other patient had a laceration of the pancreas with tearing of the splenic vein. Both recovered following operation. In these patients shock was hardly evident at first, but became serious following operation. Postoperative shock may be the serious danger; this was stressed by Mullally. Nonpenetrating injury to the abdomen may be produced in one of several ways: by impaling viscera against the bony structures of the body, by crushing of viscera against the vertebral bodies, by puncture of viscera by fragments of fractured bone and complete rupture of the stomach when it is full at the time of the accident. Most authors accord a poor prognosis to these cases and blame the high mortality to errors in diagnosis and the inability to control associated shock. Most of the prognostic conclusions are based on results of some twenty to thirty years ago and therefore do not consider the effect of modern antishock treatment.

Etiology and Treatment of Duodenal Ulcer.—After an experience of twenty years with some 4,000 operative cases of gastric and duodenal ulcer, Somervell believes that the operative treatment of duodenal ulcer should be stabilized on a firm and scientific basis, especially in India with its poor class of patient "whose stomach must be fitted for curry and rice in the shortest possible time," which depends largely on objective data and less on the personal opinion of the surgeon than has heretofore been the case. The effect of vitamin deficiency on the cause of duodenal ulceration is discussed by him and his belief is that deficiency of vitamins A and B_2 is the main dietetic cause of this condition in South India and possibly elsewhere. Roentgen examination and the fractional test meal, if operation is decided on, enable the surgeon to have a good idea before the abdomen is opened as to the best type of operation to perform. The advantages of ligation of gastric arteries in place of gastrectomy are set forward. Rapid reduction in gastric acidity is obtained by the ligation of a sufficient number of the arteries of the gastric wall. This enables the simple gastroenterostomy to be done instead of the more serious gastrectomy preferred by many surgeons in the past. Gastrojejunal ulcer is perhaps the most serious of all late sequelae of gastroenterostomy. Its treatment depends on the acidity, the general condition of the patient and the liability to recurrent ulceration as shown by the presence of more than one ulcer. Considering these three items, the best operation for any particular case can be decided soon after the abdomen is opened.

Edinburgh Medical Journal

49:721-788 (Dec.) 1942

Development of Materia Medica in Edinburgh: Inaugural Address. J. H. Gaddum.—p. 721.

Sarcoidosis: Review Based on a Case of the Disease. C. Cameron and E. K. Dawson.—p. 737.

Influence of Atropine on Complete Heart Block, Transient and Intermittent. R. A. Miller.—p. 757.

Studies on Stored Blood: X. Complement, Isoagglutinins and Agglutinogens. A. Crosbie and H. Scarborough.—p. 766.

Incidence of Bromide Medication: Study of 1,026 Admissions. H. Tod. —p. 773.

Gastroenterologia, Basel

67:113-168 (No. 3) 1942

Clinical and Roentgenologic Description of a Case of Jejunocolic Fistula Secondary to a Malignant Tumor of Descending Colon. R. Crismer.—p. 113.
*Gastroscopic Observations in Anacidity with Special Consideration of Connection Between Clinical Symptoms and Condition of Mucosa. V. T. Christiansen.—p. 125.
Gastroscopic Observations After Abdominal Operations: Internal Condition of Stomach After Cholecystectomy. L. von Friedrich.—p. 132.
*Intestinal Autointoxication as Cause of Chronic Blepharoconjunctivitis. V. L. Szerdahelyi.—p. 147.

Gastroscopic Observations in Anacidity.—Christiansen reports results obtained by gastroscopy in 52 cases of histamine refractory achylia. All presented a normal roentgenologic picture. Gastroscopy disclosed a normal mucosa in 12 cases, superficial gastritis in 15, atrophic gastritis in 15, hypertrophic gastritis in 7, single erosion in 2 and complete atrophy in 1. These observations suggest that gastritis is the most common lesion in achylia. A considerable number of cases of achylia exhibit no anatomic signs of anacidity. Complete atrophy is rare. The condition of the gastric mucosa in anacidity, with the exception of total atrophy, is identical with that found in the presence of normal or increased acidity. In order to ascertain a possible relationship between the clinical symptoms and the condition of the mucosa in anacidity the cases were divided into 3 groups. In the first group, of 12 cases, dyspepsia was absent. In the second group, comprising 23 cases, atypical dyspepsia was present. In the third group, of 17 cases, there existed a true pyloric syndrome. In groups 1 and 2 both normal mucosa and gastritis were found; in group 3 no normal mucosa was found, but only gastritis. The incidence of gastritis in anacidity seems to run parallel with the intensification of the clinical symptoms.

Intestinal Autointoxication as Cause of Chronic Blepharoconjunctivitis.—Szerdahelyi cites reports from the literature which suggest that intoxication of intestinal origin plays a pathogenic role in many general symptoms and in disorders of the type of uremia, liver cirrhosis, pernicious and other anemias, ileus, chronic dysentery, chronic arthritis, many forms of neuritis, vasomotor rhinopathia, certain allergic manifestations, eczemas, bronchial asthma and the like. The author's patient had a chronic mucous colitis and chronic blepharoconjunctivitis. Intestinal intoxication was probably responsible for both, because the eye symptoms improved or got worse simultaneously with the intestinal disorder. Vaccination with lactose nonfermenting bacteria of the patient's intestinal flora cured the intestinal disorder and the blepharoconjunctivitis.

Medicina Española, Valencia

5:317-428 (Oct.) 1942. **Partial Index**

General Therapy of Dyspepsia. E. Vidal Colomer.—p. 317.
Modern Treatment of Myasthenia. A. Subirana.—p. 341.
*Heart Disease: Electrocardiographic Prognosis. J. Almela Guillén.—p. 356.
Therapy of Hypogalactia by Combined Action of Blood and Urine of Pregnant Women. J. Uranga Goitia.—p. 372.

Heart Disease.—Almela Guillén discusses the prognostic value of the electrocardiogram in heart disease. Sinus arrhythmia, sinus bradycardia and sinus tachycardia are signs of an angioneurotic, vagotonic and vasolabile constitution respectively. These changes are of no pathologic significance. Extrasystoles which appear in the course of infections indicate myocardial infection. Auricular extrasystoles suggest myocardial damage. They appear frequently before a total arrhythmia. Ventricular extrasystoles are frequent in various diseases other than heart disease and in various physiologic states such as pregnancy. Extrasystoles which appear early in the administration of digitalis indicate acute myocardial lesions and contraindicate further administration of the drug. Extrasystoles with multiple foci of origin indicate myocardial lesions. Electrocardiograms with recurring alterations (Gallavardin's sign of alarm) indicate grave heart disease. Changes in the electrocardiograms of nervous youths and in persons who smoke excessively show functional disorders of the heart. Paroxysmal supraventricular tachycardia is of no pathologic significance, whereas ventricular tachycardia is grave. It is frequently followed by fatal ventricular fibrillation. Paroxysmal tachycardia in persons over 50 years of age indicates myocardial degeneration. The changes in the electrocardiogram which show auriculoventricular dissociation, elongation of the PQ segment in the acute period of an infection, the thickening and hooks in the main wave of the ventricular complex, changes showing bundle branch block, especially the auriculoventricular block, lowering of the ST segment below the isoelectric line and the inversion of the T wave are of grave prognosis. A low voltage of progressive lowering indicates diminution of the myocardial energy. The changes of the Q wave, especially in the third lead, are of prognostic significance when they are associated with other changes in the electrocardiogram showing myocardial infarct, coronary sclerosis, pericarditis or alterations in acute articular rheumatism. Electrocardiograms of patients with angina pectoris and with myocardial infarct are typical and of diagnostic rather than of prognostic significance. However, when the typical electrocardiograms of angina pectoris and of myocardial infarct show changes due to extrasystoles of multiple foci or a QS space of normal wideness, the prognosis is grave.

Revista Medica de Chile, Santiago

70: 735-828 (Oct.) 1942. **Partial Index**

Duodenal Diverticula. F. Donoso, A. Donoso and E. Montero.—p. 735.
Errors in Treatment of Varices. M. Casanueva, A. Velasco and E. Acevedo.—p. 741.
*Allergy to Catgut and Production of Adhesions: Experimental and Clinical Studies. H. Vaccaro and J. Cabezas V.—p. 750.
Intestinal Amebiasis. A. Donoso Infante.—p. 782.
Lobectomy for Infected Localized Bronchiectasis. A. Alonso, H. Alessandri, P. Garcia P. and F. Cancino.—p. 785.
Case of Acute Hemolytic Anemia Caused by Sulfathiazole. A. del Solar and G. Ducach.—p. 798.
Electrocardiographic Studies in Two Surgical Interventions for Wounds of the Heart. A. Garretón S., L. Hervé L. and O. Fuenzalida C.—p. 793.

Allergy to Catgut and Adhesions.—Vaccaro and Cabezas V. investigated the capacity of catgut to sensitize animals and human subjects, its specificity relations with other organic materials, its absorption in the tissues, the development of aseptic inflammatory processes and the production of the Arthus phenomenon. They were able to demonstrate the antigenic and sensitizing character of catgut. Allergy to catgut appears regularly in guinea pigs and rabbits that have undergone preparative treatment with this material. The intradermal reaction to the antigen catgut becomes positive from four to eight weeks after the preparative cutaneous or peritoneal injection. In animals sensitized to horse or sheep serum or to human serum the intradermal reaction to catgut is persistently negative. Absorption experiments in nonsensitized animals proved the total absorption of peritoneally introduced catgut without late peritoneal reactions, nodules and adhesions. Animals sensitized to catgut show the Arthus phenomenon by aseptic inflammation, production of fibrous nodules, adhesions and chiefly by osseous degeneration. Catgut introduced into the peritoneum of rabbits sensitized with either horse or sheep serum is only partially and slowly absorbed, and late peritoneal reactions develop in the form of nodules and adhesions. In animals in which the cutaneous Arthus phenomenon has been produced with sheep serum and which have also been allergized to catgut, the absorption of catgut is extremely slow or negative and is accompanied by severe peritoneal inflammation and by adhesions. In nonallergic persons who have not been operated on, intradermal reaction gave 5 per cent of positive results to meat and to serum of sheep and 3 per cent to extract of catgut. The positive intradermal reactions increase progressively when the test is made on allergic persons, on those operated on and on those who have a history of allergy and of surgical intervention. Persons with cutaneous sensitivity to extract of meat or serum of sheep may have no allergy to catgut, but sensitivity to catgut is found always in persons with positive reactions to the other antigens mentioned. In persons without a history of surgical interventions it is possible to interpret positive intradermal reactions to catgut as a sensitivity acquired by the digestive tract to the meat of sheep because the two antigens have a common origin. The authors recommend preoperative tests for sensitivity to catgut and replacement of catgut by nonabsorbable suture materials without antigenic properties.

Book Notices

Gas Warfare: A Monograph for Instructors. Compiled by W. K. Fitch. Published by the Pharmaceutical Society of Great Britain. Paper. Price, 2s. 6d. Pp. 103. London: Pharmaceutical Press, 1942.

This booklet represents an attempt to give a brief but well balanced survey of the whole field of gas warfare within the limits of a hundred small but closely printed pages. It is described as "a monograph for instructors" in the civilian defense and other similar organizations. One of its main purposes (as stated in the preface) is to give to the instructor a background which will enable him to "get the trainee to view the gas menace through the eyes of the chemist as something that need arouse no anxiety." With this purpose the reviewer is most heartily in sympathy. And the booklet is, on the whole, well designed to attain the object in view. It is well seasoned with interesting historical details, and the distribution of emphasis is on the whole just (one chapter devoted to tactics, seven chapters devoted to defense). The twenty page chapter entitled "General Properties of War Gases" is much too detailed. No less than twenty-five toxic agents, some of them completely obsolete, are discussed at length. Ten would have been ample. Some of the data given are, moreover, inaccurate. The booklet may be recommended not only to the instructors for whom it is intended but to any one with a rudimentary scientific training who wishes to acquaint himself, by two or three hours of reading, with the general subject of gas warfare. The reviewer is not sufficiently well acquainted with other publications of the same nature to venture on a comparison.

Fundamentals of Immunology. By William C. Boyd, Ph.D., Associate Professor of Biochemistry, Boston University School of Medicine, Boston. Cloth. Price, $5.50. Pp. 446, with 45 illustrations. New York: Interscience Publishers, Inc., 1943.

The purpose of this book is "to serve as introduction to immunology for medical students, chemists, biologists and others interested in an understanding of the basic principles of the science." The chapter headings will show the scope and plan of the contents: immunity and immunology; antibodies and antibody specificity; antigens; blood groups; antibody-antigen reactions; complement and complement fixation; anaphylaxis and allergy; allergy and immunity (bacteria, viruses, parasites); practical use of artificial immunity; laboratory and clinical technic. At the end of each chapter are references to "the latest and most pertinent literature." The last chapter, the longest, deals with immunologic methods and their application to certain diseases. The emphasis in the earlier chapter is on the basic principles as presented from the point of view of the chemist. It is assumed "that the reader has a slight previous acquaintance with organic chemistry and bacteriology." More than a slight acquaintance with chemistry would be needed to understand the discussion of conjugated antigens, the influence of optical activity and the preparation of synthetic antigens. The book meets its general purpose well but may be better suited for the chemist and the investigator than for the medical student, especially now when the medical course is shortened.

The Application of Absorption Spectra to the Study of Vitamins, Hormones and Coenzymes. By R. A. Morton, D.Sc., Ph.D., F.I.C., Department of Chemistry, The University of Liverpool. Second edition. Cloth. Price, $6.50. Pp. 226, with 82 illustrations. Boston: Jarrell-Ash Co.; London: Adam Hilger, Ltd., 1942.

The value of absorption spectroscopy in the isolation of natural products and the determination of their chemical structure is well illustrated by this timely revision of a useful volume the first edition of which appeared in 1935. The increased size and scope of the present book is an index of the tremendous advances which have occurred in the application of absorption spectrum data to the elucidation of the structure of complex molecules. The style of the first edition has been retained. Each section is a chronological treatment of the detection, concentration, isolation, structural determination and, in many cases, synthesis of a particular natural product, with the emphasis on the part played by absorption spectrums in each stage of progress. Thus the volume not only provides spectroscopic data for the various subjects presented but is, in addition, an excellent summary of our present knowledge of the topics discussed. Numerous references to the original literature and tables of spectrums with accompanying structural formulas are provided throughout.

A brief introductory chapter discusses the standardization of spectrometric apparatus, provides a definition of the notation used in the following chapters and includes a bibliography of recent books and review articles on spectrophotometry. The chapter on steroids, provitamins and vitamin D and hormones has been greatly expanded and provides an excellent survey of structural determinations in this field. Since the first edition appeared, the chemistry of provitamins and vitamin A has been elucidated; a comprehensive review of this progress is now included. The status of spectrographic determinations of vitamin A is discussed, as are the results of collaborative studies in this field. The chemistry and spectrums of vitamin E are clearly stated, and the subject of antioxidants, which is of current interest, is discussed briefly. Chapters on vitamin K, vitamin P, vitamin B complex, purine and pyrimidine derivatives, proteins and enzymes and coenzymes represent additions not present in the first edition.

The volume should be highly useful to the worker who may be called on occasionally to make use of absorption spectrum data, as well as to the trained spectroscopist.

Obstetrical Practice. By Alfred C. Beck, M.D., Professor of Obstetrics and Gynecology, Long Island College of Medicine, Brooklyn. Third edition. Cloth. Price, $7. Pp. 938 with 1,064 illustrations. Baltimore: Williams & Wilkins Company, 1942.

The appearance of a third edition of this book in seven years is an indication that it is popular. The new edition contains eighty more pages and twenty-three more illustrations than the second edition. There are five more chapters in the new book, but this is because the author separated the material on operative obstetrics into six chapters. Many illustrations have been redrawn, and most of those in the section on operative obstetrics have been enriched by the addition of color. However, the reproductions of roentgenograms are so poor that they should not have been printed.

Throughout this edition, as in the previous two, there is abundant evidence of the author's extraordinary ability as an obstetrician and as a teacher. In view of Beck's contribution to the technic of the low cervical cesarean section, this operation is described and illustrated in great detail. Furthermore, the details of the use of local anesthesia for this operation are given.

It is surprising and perhaps unfortunate that the author did not see fit even to mention the classification of the toxemias of pregnancy advocated by the committee appointed by the American Committee on Maternal Health. One of the purposes of this classification was to have a standard by which comparisons of different forms of treatment of the toxemias could be made.

About sixty pages are devoted to references, and many lists are disproportionately large. For example, seven pages of references are devoted to the fetal membranes and eight to the changes in the maternal organism, but only one and a half pages of references are assigned to the management of pregnancy, only one page to the management of labor, only one page to combined placenta previa and accidental hemorrhage and only two and a half pages to the toxemias of pregnancy.

The author still speaks of "medical complications of pregnancy" when referring to the occurrence of pregnancy in women with heart disease, pulmonary tuberculosis and diabetes. In these associations it is the pregnancy which is the complication of the illness and not vice versa. There is a full page illustration of the Walcher position in spite of the fact that James Young and others have proved by radiographic means that this position does not enlarge the pelvic inlet, as was formerly believed.

In spite of these criticisms the book is an excellent textbook of obstetrics. It is well written, the type is clear and, except for the roentgenograms, the illustrations are highly instructive. The popularity of the book is deserved and the volume will undoubtedly retain its place as one of the leading textbooks on obstetrics.

Psychologic Care During Infancy and Childhood. By Ruth Morris Bakwin, B.A., M.A., M.D., Assistant Clinical Professor of Pediatrics, New York University College of Medicine, New York, and Harry Bakwin, B.S., M.D., Associate Professor of Pediatrics, New York University College of Medicine. Cloth. Price, $3.50. Pp. 317, with 31 illustrations. New York & London: D. Appleton-Century Company, Incorporated, 1942.

This is a book written by two pediatricians rather than by orthopsychiatrists, and consequently the point of view is modified by the failure of the authors to understand some of the more deep seated psychologic factors. In general, however, the book covers a vast amount of data, some of which would be of value to the pediatrician, some of value to the psychologist and much of a great deal of value for the physician who has the task of caring for children and their parents. There are thirty-four chapters, which means that such important topics as poor sleep is given only three pages, the adjustment of the child to nursery school is given less than one page and parental overprotection, which is the problem most frequently met in child guidance clinics, has only one page, so that the whole field of child psychology is covered widely but not deeply. The first six chapters of the book deal with basic principles, history taking and the diagnosing of psychologic problems. The next six chapters cover special psychologic considerations such as emotions and mentality, while the remainder of the book consists of scattered topics some of which deal with special problems such as lateral dominance, special types of mental deficiency, disturbances associated with physical states and other more general topics such as play training or school problems or the sick child's psychology. Some of the material, such as that of lateral dominance and lefthandedness, is not consistent with general beliefs on the subject, and much more emphasis is placed on mental deficiency than is needed in a book of this sort. The chief defect of the book is an overemphasis of a multitude of specific features and an underemphasis of dynamic considerations in causes of maladjustment of the child in the home, in the school and under the care of the physician. Nevertheless this is the kind of book for a person who needs a complete survey as an introduction to deeper, more comprehensive and perhaps more useful books on child psychiatry and developmental psychology.

Atlas of Ovarian Tumors. By Gemma Barzilai, M.D. Preface by Fred W. Stewart, M.D., Pathologist, Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York City. Cloth. Price, $10. Pp. 261, with 258 illustrations on 58 plates. New York: Grune & Stratton, 1943.

This is an atlas of microscopic diagnosis. As stated in Dr. Stewart's preface, it is timely and complete. The illustrations are good. The morphology, genesis and other features of each ovarian neoplasm are described systematically in the text, but the literature is not reviewed except that helpful lists of synonyms are given. Treatment is not discussed in detail. The statements about radiotherapy are only general and are sometimes vague. Writing about disgerminoma (p. 97) the author says that "the tumor is extremely radiosensitive and the destroying dose is about one third of the dose usually needed to control a cancer." We are not told, however, what the controlling dose of cancer is. The publisher's part is well done. The paper and the print are first class, the plastic binding works smoothly, but much space is wasted in wide margins and empty backs of plates. The atlas will be of valuable service to clinicians and pathologists in their work with ovarian neoplasms.

The Horses of the Sun. By Dr. Kathryn M. Whitten. Cloth. Price, $2. Pp. 314. Boston: Meador Publishing Company, 1942.

This is a novel written by a physician which deals with the life of a spinsterish New England girl who first goes into nursing and then, after showing her executive ability and medical ingenuity when the survivors of a train wreck are brought into the hospital where she is working, is encouraged to go into medicine. The work not only deals with the seamy side of her life before her entry into the medical profession but also tells of her struggle against some of the less prepossessing members of the profession, particularly those whose ethics are definitely below par. Dr. Whitten's style is somewhat stilted. It probably would be of more interest to the layman than to the physician, but the physician would realize that most of the unsavory characters are not typical of the medical profession.

Religion and Health. By Seward Hiltner. Cloth. Price, $2.50. Pp. 292. New York: Macmillan Company, 1943.

It might appear on first inspection that this book had been improperly titled. Such an impression would be erroneous, because the author is referring to "total health." He has realistically recognized and stressed the fact that mental and physical health cannot be treated as separate entities. Although the major contributions of the book are related to psychologic problems, the physical, particularly the physical which is closely related to the psychologic, has not been neglected. In some respects this is a difficult book to evaluate. Parts of it are exceptionally good, while other parts are vague and sometimes misleading. For example, the author states on page 23: ". . . mental hygiene is not to be equated with science. It is more nearly akin to technology . . . but it contains certain assumptions which are more closely related to religion than they are to science." While the author attempts to show proof for this statement, the proof appears entirely unconvincing. There are other equally challenging statements relative to religion and mental hygiene which the reader must study and evaluate for himself. In spite of these criticisms the book can do no harm and may well prove of great value, especially if it reaches even a small minority of an all too extensive public that is almost completely uninformed regarding our present knowledge of psychologic and sociological problems. It is obvious that the author has considerable insight into the psychologic and sociological problems of our present society. His attempt to transmit his information and insight to the clergy and the parish is both ambitious and praiseworthy. How much success will attend his efforts only time will tell. The pages which he devotes to psychosomatic research alone are worthy of wide publicity. This comparatively new and extremely important field for investigation should be publicized by every humanitarian. The author could well have included more recent findings and reports in this and other allied fields, but interested readers will find this book and the reference material, which is carefully listed, as excellent groundwork for further study. The book is well written in language that is easily understood. Psychiatric jargon is either eliminated or carefully defined. Although the author must have read considerable psychoanalytic literature, the contributions of psychoanalysis to the understanding of human behavior have been given small credit. In fact there are references to psychoanalytic contributions as products of the mental hygiene movement. While this may be confusing to the psychiatrically oriented reader, it does not detract from the value of the book.

Diet Manual Mount Sinai Hospital, Philadelphia. Third edition. Loose-Leaf. Paper. Price, $2.50. Pp. 74. Philadelphia, 1942.

This gives a complete list of therapeutic diets as used in a modern hospital. The diets are given in actual food portions as well as in caloric units, and sample menus are included. A section on the feeding of children has been added. A valuable feature of the volume is the inclusion of some general considerations on the procedures and principles of particular dietary practices. References to the medical literature indicate the original sources of information. This collection should be of interest and use to other institutions and to private practitioners in the construction of diets for use in the home. However, its present multigraphed and paper covered format makes it somewhat difficult to read and handle.

Essentials of Nutrition. By Henry C. Sherman and Caroline Sherman Lanford, Columbia University, New York. Second edition. Cloth. Price, $3.50. Pp. 442, with 34 illustrations. New York: Macmillan Company, 1943.

Since the publication of the first edition of this book, a national nutrition program has been outlined; the National Research Council has set up its recommended daily allowances for specific nutrients. The new edition of this book reflects this progress. Moreover, there have been additions to the known vitamins, especially in the field of the so-called vitamin B complex. The present edition calls attention to these additions and makes available references to the periodical literature on the subject.

Queries and Minor Notes

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BILIARY COLIC OR CORONARY OCCLUSION

To the Editor—A man aged 52, Italian, had an appendectomy in April 1942. Perusal of the chart shows that the appendix was gangrenous and perforated at the tip and that there was a small abscess around the tip. Drainage was maintained for about two weeks and the wound closed thereafter, without further complications. A nurse once made a remark about "irregular pulse" in her notes, but nothing further is known to either the surgeon or his associates. The man resumed his strenuous occupation as chef of a big restaurant almost immediately after his dismissal. He felt entirely well until September, when he began to complain of much "gas" and occasional pain in the epigastrium; at the same time he also commenced feeling increasingly tired. On November 7 he suddenly experienced excruciating pain in the upper epigastrium. The pain was sharp and cramplike and did not radiate. The attack lasted four hours. A few hours later the patient was found to be jaundiced. I did not see him until November 10, at which time he still showed mild jaundice and bile was found in the urine. The stools were not claylike. The icteric index was 17. The urine also contained albumin 2 plus, a trace of sugar and a few red blood cells and white blood cells. The white blood count was 14,000. Clinically the heart was definitely enlarged to the left. Its action was rapid and entirely irregular. No murmurs were heard. The blood pressure was 130 systolic, 85 diastolic. The liver was just palpable below the costal margin. There were no tenderness, no evidence of fluid anywhere in either the thoracic or the abdominal cavity and no edema. The pulse was 114, entirely irregular. Respiration was 20 a minute. A cardiogram showed auricular fibrillation. The patient was placed on a fat free diet with medication of bile salts and was digitalized at the same time. One week later the jaundice had disappeared, the liver was no longer palpable and there was no dyspnea. The ventricular rate had fallen to 84. Fibrillation is, of course, still present. The patient is now entirely free from complaints and wishes to return to work. I should deeply appreciate an opinion as to the most probable diagnosis and prognosis, further treatment, and how long the patient should be kept away from work. M.D., Massachusetts.

ANSWER.—Before the prognosis and management of this case can be appraised, a more definite diagnosis is necessary. The attack of November 7 sounds much like biliary colic. The correctness of this diagnosis should be confirmed by a cholecystogram. Another possibility to be considered is that the attack of November 7 might have been coronary occlusion. Judging from the description given, the jaundice was out of proportion to the other symptoms present and hence much more suggestive of biliary colic than of coronary occlusion. However, the cardiac findings given suggest that occlusion might have occurred. Serial electrocardiograms would be helpful in this regard. If cholelithiasis is found, it may be assumed that the attack of the 7th was biliary colic. The enlargement of the heart, fibrillation and probable cardiac decompensation would then be ascribable to some other cause, perhaps arteriosclerotic heart disease. If gallstones are found, the question arises as to whether operation should be advised. The patient probably would survive such an operation. However, if this was the first attack of biliary colic, the more conservative procedure might be to defer operation until further attacks occur. If no gallstones are found, coronary occlusion is the most likely diagnosis. In this circumstance it would be well to advise the patient to remain away from work for a total period of three months if possible and then return to light work. The administration of digitalis should be continued.

The trace of sugar in the urine is probably not significant and could be checked by additional urine examinations and a fasting blood sugar. The albumin may well be due to the cardiac decompensation. The few red and white blood cells are probably not significant.

IMMUNIZATION OF STUDENT NURSES TO SCARLET FEVER

To the Editor:—What is the present status of the question of immunizing student nurses in a general hospital against scarlet fever?

William E. Bayley, M.D., La Crosse, Wis.

ANSWER.—Testing for susceptibility and immunization of susceptibles against scarlet fever in the student nurses has been adopted as a routine procedure in a number of the larger general hospitals located in climates where scarlet fever is prevalent.

RESORCINOL DYES AND RESORCIN DERMATITIS

To the Editor:—I am a practicing surgeon and for the past years have been having frequent attacks of what has been diagnosed by capable dermatologists as contact dermatitis due to resorcin. I have no resorcin in my office and come in contact with none at the hospital. Is it possible that resorcin is used as a dye in upholstered furniture or in clothing and could I be getting my contact dermatitis from such exposure? If so, could you tell me in what type or color of clothing or upholstering resorcin may be used as a dye? M.D., Iowa.

ANSWER.—Resorcin is an ingredient in a number of dyes. The following is a list of dyes in which resorcin is one of the chemicals used in manufacture:

1. Resorcine Brown, also known as Aceko Phosphine G, Tropeoline NRN, Orange Special AP and Resorcine Brown G. The components used in the manufacture of this dye are sulfanilic acid, meta xylidine and resorcinol. This dye is used mainly for dyeing leather but it will also dye wool.

2. Resorcine Dark Brown, also known as Fast Acid Brown, Amacid Fast Brown, Resorcine Brown RN and Aceko Dark Brown RD Fast Brown. The components used in manufacturing this dye are naphthionic acid and resorcinol. It is used for dyeing wool.

3. Resorcine Yellow, also known as Phosphine Substitute, Chrysoine, Yellow T, Pure Yellow for wool N, Gold Yellow, Tropaeoline O, Acme Yellow, Chryseoline and Orange RL. The components of this dye are sulfanilic acid and resorcinol. It is used mainly for dyeing silk and leather.

4. Nitroso Blue MR, also known as Resorcine Blue, Nitroso Base M and Tannoxydophenol. The components of this dye are resorcinol, p-Nitrosodimethylaniline, hydrochloride and tannin. It is used in calico printing and also dyes cotton.

5. Fluorescent Blue, also known as Resorcine Blue and Iris Blue. The components are resorcinol, nitroso resorcinol and brominate. It is used for dyeing silk and to some extent for dyeing wool.

6. Resorcine Brown 5 G, an azo acid dye made by du Pont.

7. Resorcine Brown 3 R, an azo acid dye made by du Pont.

8. Resorcine Green No. 1.

As can be judged from this list, resorcin may be an ingredient of dyes used in silk, wool, cotton and leather.

Resorcin is a phenol, and if one is sensitive to resorcin it is possible that one may also be sensitive to carbolic acid or materials containing it.

The resorcinol used in the manufacture of the dyes mentioned is supposedly completely combined with the other components, forming an entirely new chemical compound. It is possible, but not probable, that in some batches of these dyes the resorcinol is not completely combined or is in excess. In such cases it would be possible for one hypersensitive to resorcinol to develop a dermatitis from contact with fabrics containing such imperfect resorcinol dyes.

STEAM RADIATORS AS POSSIBLE CARRIERS OF INFECTIONS

To the Editor:—I have often wondered if steam radiators might be possible carriers of infectious diseases, including the common cold, in apartments, offices and schools, and, if so, has any thought been given to this problem? When the heat is on, the radiators and their connecting pipes contain steam and the condensation, moisture, which returns to the heating unit. When the heat is discontinued or diminished, as happens at night, air from the room is drawn in through the radiator valve to occupy the space the steam has vacated. When the steam pressure is increased, air is expelled through the radiator valve. Naturally allowance must be made for the size of the heating unit, space heated, distance from the heating unit and if height is sufficient to require a steam pump. Does the expelled air represent the same air which was drawn from the room or is it a mixture of air from other heated spaces? This withdrawn air and the expelled air are not heated, other than possibly that portion in direct contact with the steam. Would this be a possible carrier? Some radiators have traps on them but many do not.

George P. Nicholson, M.D., Chicago.

ANSWER.—There is no information available as to whether steam radiators might become carriers of infectious diseases under the conditions described. Such a possibility would be limited largely to one-pipe steam heating systems installed in inexpensive homes and apartment houses. The system is generally undesirable for other reasons, particularly noise ("water hammer") and offensive odors in the air discharged into the room from the air valves. Whether organisms can live long in the pungent and humid atmosphere inside the radiators is another question.

Large buildings are heated by vapor or vacuum systems which have no radiator air valves. The air is vented in the basement or discharged outdoors.

LIGHT WORK FOR PATIENT WITH OCCASIONAL TUBERCLE BACILLI IN SPUTUM

To the Editor:—Would it be advisable for a young physician to engage in part time (institutional) work while having an occasional sputum specimen positive for tubercle bacilli? The patient has been in a tuberculosis hospital continuously for the past thirty months. On admission the diagnosis was bilateral infiltrative lesions with endobronchial tuberculosis. No evidence of cavitation was ever found on repeated examinations (including laminography). Endobronchial lesions have been found to be (1) a granuloma which cleared up, (2) ulceration also now cleared and (3) tubercles also cleared up. In spite of negative bronchoscopic findings there has been an occasional positive sputum specimen (every third month). Parenchymal lesions have been checked. As these findings of positive sputum have been present for the past fifteen months without any apparent reasons for them, the patient would like to know if he couldn't work three to four hours a day so as to keep his mind occupied, as now he is repeatedly becoming depressed and discouraged (also because of his lack of interest in things in general, as the only diversions opened to him at the institution are reading and the radio).

M.D., New Jersey.

ANSWER.—When it is advisable for a tuberculous patient to resume work is dependent on several factors. A considerable number of patients who have their disease brought under control so as to have no clinical manifestations and whose lesions appear to be well stabilized continue to have tubercle bacilli recovered occasionally from the sputum. Others who apparently have no sputum have bacilli revealed in gastric washings; indeed, this is true of a good many persons who have been adequately treated and discharged from hospitals and sanatoriums. It is not surprising when one considers that no present method of treatment destroys tubercle bacilli and that they may remain alive in large numbers in old, apparently well controlled lesions the entire lifetime of the individual. More accurate methods of examining for tubercle bacilli and more frequent examinations are bringing to light the fact that tubercle bacilli are occasionally eliminated in many so-called arrested cases of tuberculosis. This may occur with no evidence of reactivation of old lesions or appearance of new ones. Unfortunately, one is never certain as to the exact source of the tubercle bacilli, and therefore one is likely to be suspicious of nondemonstrable spread of an area of disease or the development of a new lesion still so small or so located that it cannot be demonstrated by present methods of examination.

It appears that an excellent therapeutic result is being obtained in the case of this young physician. This is particularly true of the endobronchial lesions. However, there remains the possibility that other lesions beyond the areas visualized by the bronchoscopist may not be as well controlled as those seen and therefore may be responsible for the tubercle bacilli occasionally found in the sputum. Moreover, there may still be small areas in the region of the parenchymal disease which are still eliminating tubercle bacilli. After thirty months of excellent institutional care with such an apparently good clinical result and with no evidence to the contrary it would seem safe to institute graduated exercise in the form of light work about the institution under most careful observation, using the necessary precautions to protect fellow workers and patients against possible infection.

PRIMARY TUBERCULOSIS COMPLEX

To the Editor:—A patient has just been rejected in the army draft for "tuberculosis, pulmonary, primary complex, unstable." The meaning of "primary complex, unstable" is unknown to me. Does this mean an active or an inactive tuberculous lesion? I presume the lesion is in the parenchyma.

Nina C. Wilkerson, M.D., Sturgis, Mich.

ANSWER.—In the majority of persons with primary tuberculous complexes the only evidence of its existence during life is the reaction to tuberculin. There are no symptoms, physicial signs or x-ray shadows to aid the physician in determining the location of the lesions. This may be because (1) the lesions do not attain sufficient size to cast shadows visible on the x-ray film, (2) the lesions may be located in that 25 per cent of the lung which is not visualized on the film and (3) the primary lesions may be located in parts of the body other than the lungs. However, in such persons lesions can be found when sufficiently careful postmortem examinations are made.

In a smaller number (usually not exceeding 30 per cent) of persons with primary tuberculosis complexes, evidence may be found of calcium deposits in the pulmonary parenchyma, the hilus region or both by fluoroscopic or x-ray film inspection. Obviously not all of such deposits represent tuberculous lesions, since there are other causes of calcifications in the lungs.

In an extremely small number (3 to 5 per cent) of persons with primary tuberculosis complexes evidence of the lesions appears in the parenchyma of the lung about the time the tissues become allergic. There may or may not be temperature elevation but, if so, it usually does not persist for more than one to three weeks. If other symptoms are present they are not unlike those of a common cold or influenza. Usually there are no abnormal physical signs. The red blood sedimentation rate may be increased for a few weeks. When the lesion is located in that part of the lung which is visualized by the x-ray film it casts a dense, homogeneous shadow which varies in size from one barely large enough to be seen to one involving an entire lobe. This is due either to (1) collateral inflammation around the primary lesion in the lung or (2) atelectasis as the result of occlusion of a bronchial ramification caused by enlarged regional lymph nodes. If the former the shadow may remain unchanged for many months, after which it slowly disappears. By the time the original shadow is no longer visible or at some later time there may appear one or more small, sharply outlined dense shadows which represent calcium deposits that began as microscopic areas and gradually attained macroscopic proportions. Throughout this period there usually is enlargement of the hilus shadows on the same side, probably because of the tuberculous lymph nodes which have become a part of the primary tuberculosis complex. As the primary lesion in the parenchyma subsides, the regional lymph nodes become smaller and calcium deposits may be visualized in them about the same time as they are seen in the lung parenchyma. Apparently the patient's condition belongs to this small group in which the primary parenchymal lesion is found while the collateral inflammation is present or the regional lymph nodes are large enough to obstruct a bronchial ramification.

To determine that the lesion is tuberculous required the presence of a characteristic tuberculin reaction. Tubercle bacilli may also have been found in the sputum or gastric washings, or several x-ray film inspections were made of the chest to demonstrate the chronicity of the lesion.

When the disease was found to be tuberculous there must have been a record of repeated tuberculin tests previous to the complete examination to justify a diagnosis of primary disease. In other words, this patient must have been known to be a nonreactor to tuberculin and to have become a reactor about the time the examination was made. By single x-ray film inspection it is impossible to differentiate between primary and reinfection types of lesions. Moreover, it is not possible to differentiate between tuberculous and nontuberculous lesions, since there is no absolutely characteristic shadow of any disease. If tubercle bacilli were found in the gastric contents they may have emanated either from a primary or a reinfection type of lesion, since in this manner bacilli may be recovered in about 25 per cent of persons with primary lesions in the pneumonic stage.

To determine that the lesion is unstable required a period of observation. Primary tuberculous lesions change so slowly that a single examination including all its phases does not suffice to determine their stability.

The words active and inactive with reference to tuberculous lesions should be used exclusively in connection with the reinfection type of tuberculosis. Primary pulmonary lesions differ so much in their behavior from the reinfection type of lesions that they could easily be regarded as an entirely different disease entity. Indeed, primary lesions begin to develop on tissues that are not sensitized to tuberculoprotein and therefore the reactions to them are nonspecific; in fact, no different during the first few weeks than the reactions of the tissues to such inanimate objects as particles of silica. Therefore, in the early stages of their development primary lesions are extremely benign. Even when a lesion is decreasing in extent it may be considered pathologically active. However, the usual conception of the word activity is that it indicates progressive clinical disease. Progressive primary pulmonary lesions apparently are extremely rare. Most of them gradually recede and never present clinical manifestations.

SASSAFRAS TEA SUBSTITUTED FOR COFFEE

To the Editor:—Is there any evidence to support the belief that substitution of sassafras tea as a beverage for coffee would prove harmful?

Joseph H. Kinnaman, M.D., Ponca City, Okla.

ANSWER.—There has not been any evidence found to support the belief that sassafras tea would be harmful when substituted as a beverage for coffee.